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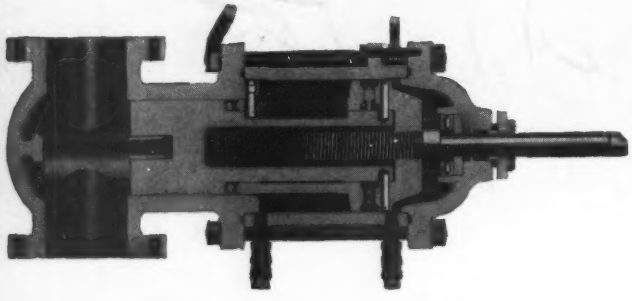
CALIFORNIA WILD WELL CAMERON-IZED!

1. After blowing out, Gough No. 12 craters and burns for two days.

The obvious lesson to be drawn from the successful capping of Gough No. 12 in the El Segundo field is that equipment designed to withstand substantial cutting action and still seal tightly is worth whatever it costs in a capping manifold built to specific requirements. It is also obvious that men experienced in assembling and installing special manifolds quickly are indispensable factors in getting the job done promptly and satisfactorily.

It will be apparent to thoughtful operators that the same Cameron Control Unit which figured in the capping of Gough No. 12 may be relied upon implicitly to "LOCK THE BARN BEFORE THE HORSE RUNS AWAY."

Below: Cross-section view of a Cameron 6000-Lb. Test Pressure Operated Gate Valve clearly showing its unique design and construction. Fast, positive pressure closing eliminates risk to men and equipment. Note that there are no delicate sealing surfaces. The self-feeding ram packing "flows" to and seals any pits or roughness on the valve seat.



2. Fire extinguished and wreckage pulled from the well. Flowing estimated 40 to 50 million cu. ft. gas.

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Export: 74 Trinity Place, New York, N. Y.
California Distributor: The Howard Supply Co., Los Angeles
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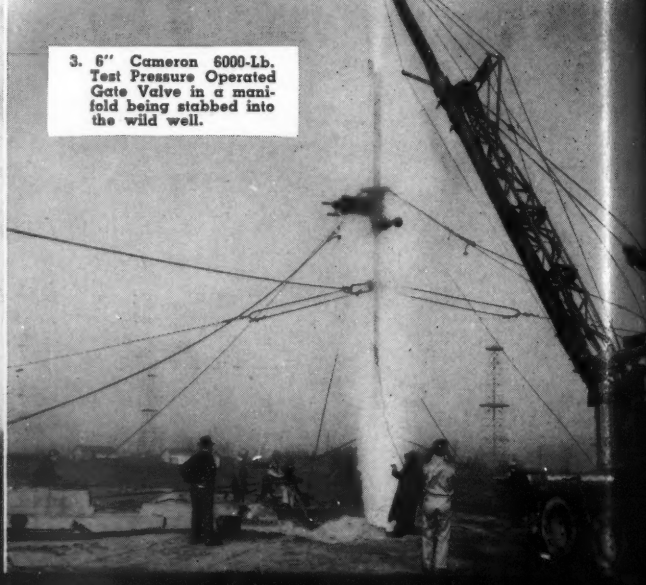
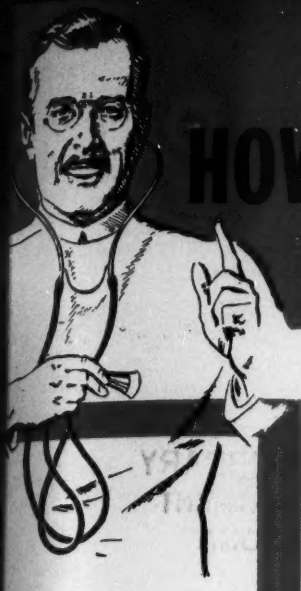
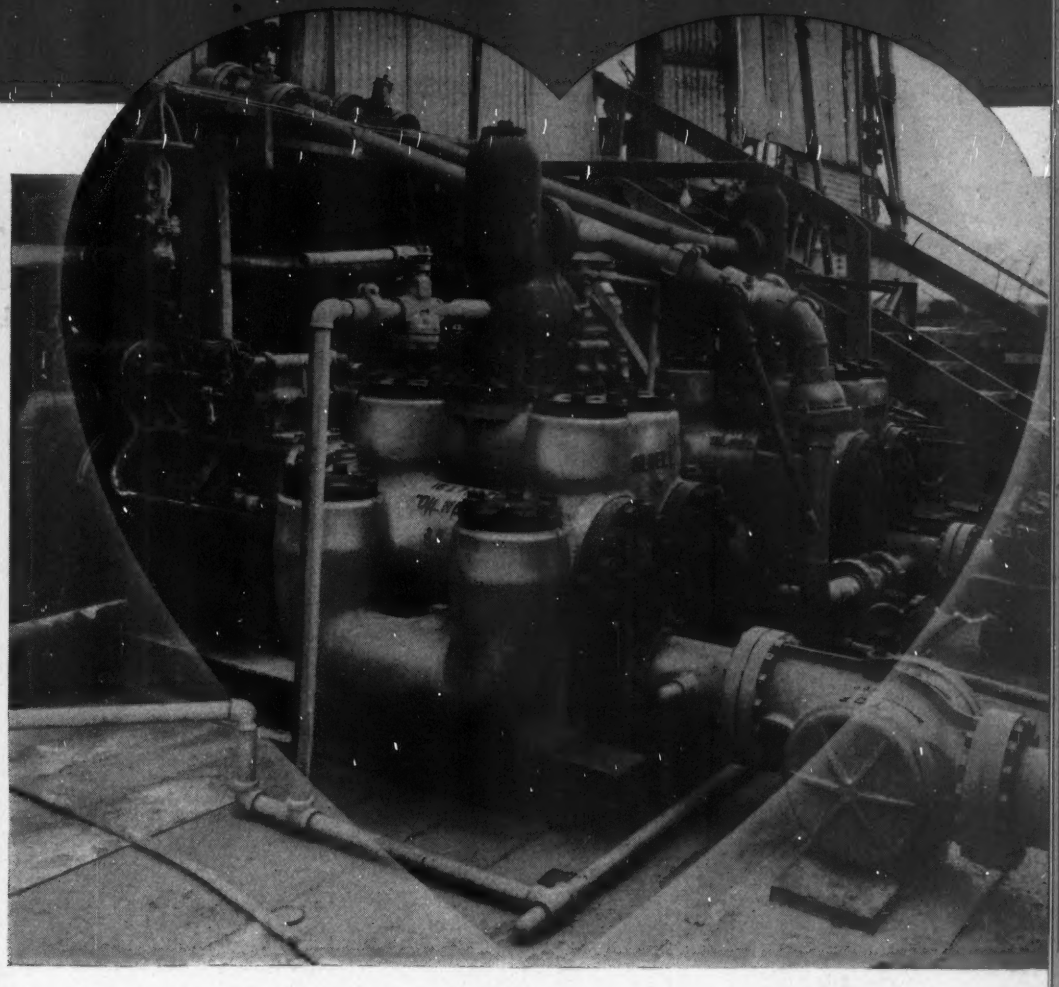
4. Cameron Valve withstands cutting action of well flow for 2 hrs. and 5 min., then closes and seals perfectly.



3. 6" Cameron 6000-Lb. Test Pressure Operated Gate Valve in a manifold being stabbed into the wild well.

HOW STOUT IS YOUR HEART?





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lowest operating cost spec- only genuine "Oilwell" and lson-Snyder replacement rts. "Oilwell" DI-HARD ers, for example, give sev- l times the service life of er liners and proportionately luce the frequency of pis- replacements. DI-HARD ers, given proper care, have blished many outstanding ords, including one exceed- 140,000 feet of drilling be- e replacement.

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Request complete information on the size and type that will best suit your requirements.

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THE AUTHORITY ON THE CALIFORNIA OIL INDUSTRY

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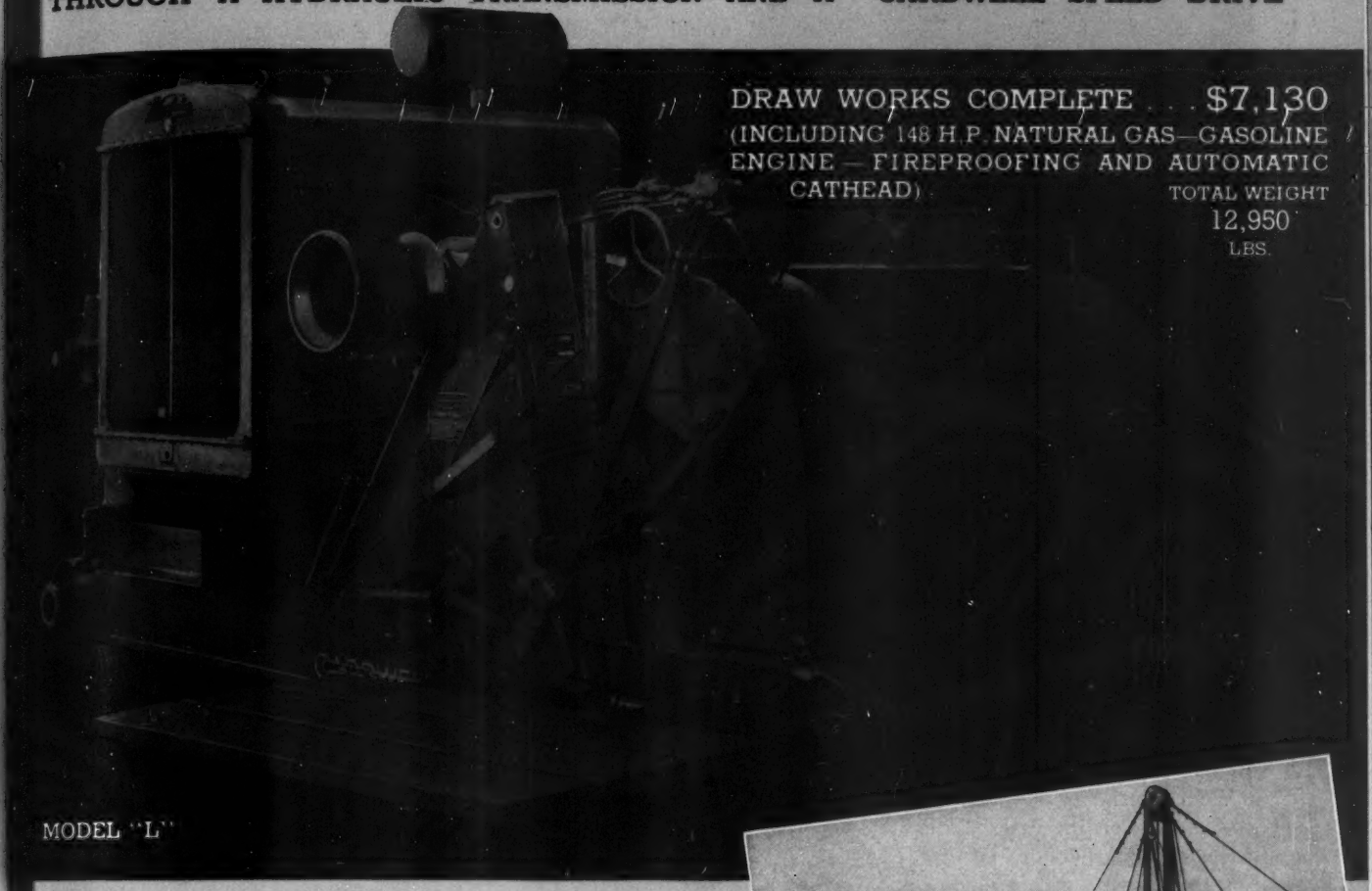

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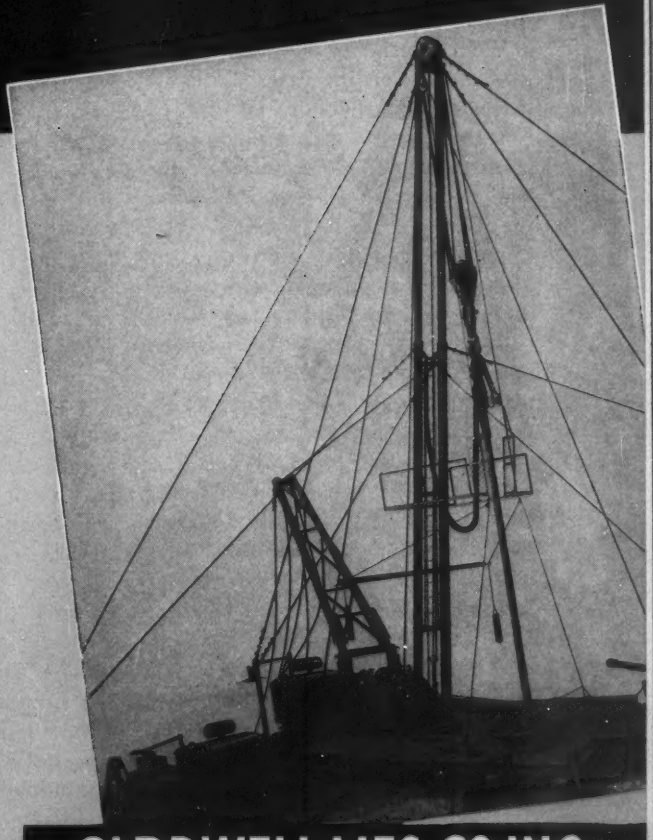

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San Fernando Reservoir Anticline Geology

The Barriers to Prospecting Removed

By Louis C. Chappuis
Consulting Engineer & Geologist

Now that the residents of the San Fernando hills have lost their battle before the Planning Commission and the City Council opposing the granting of a zoning variance permitting the drilling of oil on their estates, the Continental Oil Company is free to proceed with much delayed plans to wildcat in this area.

The land in question in the beauteous San Fernando Valley was bought for its residential attractiveness by the protestants who did not own mineral rights to the lands and who objected to the ingress of the oil companies with their unsightly derricks et al, marring the beauty of their terrestrial paradise.

These lands have changed hands many times. In 1874 Senator Charles Maclay acquired from Eulogio F. de Celis 56,000 acres which extended from the mountains back of Chatsworth on the west to the Roscoe area on the east. Later he took into partnership George K. Porter, a San Francisco shoe manufacturer, who became owner of the land in question. From Mr. Porter the San Fernando Mission Land Company acquired several large blocks of land, part of which they in turn sold to the Sunshine Company in 1919, but they retained the mineral rights. The Sunshine Company sold out to a Los Angeles subdivider who placed a first mortgage on their holdings with the California Bank. Upon failure of the subdivider to comply with the terms of his loan the California Bank foreclosed the mortgage. Within the last decade several parcels of these lands were sold, with certain mineral reservations and restrictions. It was these buyers who objected so positively to oil development of that area inasmuch as such development would be of no personal gain to them and would, to some extent, detract from the beauty of the surroundings.

However, they have lost their fight and Continental is now free to prove or disprove the possibilities of the so-called Reservoir Anticline. Let us look into the geology and oil possibilities of the area:

Geology: The structural conditions existing in this general area are those of a single sinuous asymmetric anticlinal fold trending northwest and due east, with the gentle flank dipping to the northeast and north. Along its trend (over 4 miles in length) there are two perceptible structural highs or domes. One of these highs occurs at the locality where Continental's Howell No. 1 well is being drilled, the other in the area of the Foothill Orchards Company. The rocks exposed at the surface and over the terrain where this anticlinal fold exists are the coarse brown sandstones and conglomerates, claystones and diatomaceous shales of Pico age (Lower Pliocene).

Past Drilling History: In the years 1918-1921 the Standard Oil Company of California drilled two wells in Lot 4, TR: 10-4,22, known as Mission 1-1 and Mission 1-2. Mission 1-1 was drilled to a total depth of 3113 feet. Showings of oil and gas were logged in this well at 1350 feet. The well was bottomed in blue shale, "Pico". Mission 1-2 was drilled to a total depth of 4003 feet. No showings were reported from this well which also bottomed in the Pico formation. Due to the inability of penetrating to greater depths in those early days the wells were abandoned.

Barring unknown faults and unforeseen abnormal subsurface conditions, the well being drilled by the Continental Oil Company will have the possibility of encountering two out of the three well known productive horizons which we know to underlie the area in question, namely,—the Pico of Pliocene age, all the zones of Miocene age, or the rocks of Eocene age.

The oil fraternity as well as the residents of the San Fernando Valley will watch with a great deal of interest the outcome of this worthwhile wildcat.

Companies which to date have acquired leases in the area are the Continental Oil Company, the Shell Oil Company, the Petrol Corporation, General Petroleum, Pacific Western Oil Company and Century Oil Company.

The accompanying map (pages 20 and 21) shows the location of the wells drilled by the Standard Oil Company, the well being drilled by Continental, the lands held by the above named companies, and the general trend of the anticlinal axis.

Please Turn to Pages 20-21 for Map of This Area.

Legal Difficulties Surmounted in Flood Control Drilling by Continental

By George H. Emerson
Attorney-at-Law

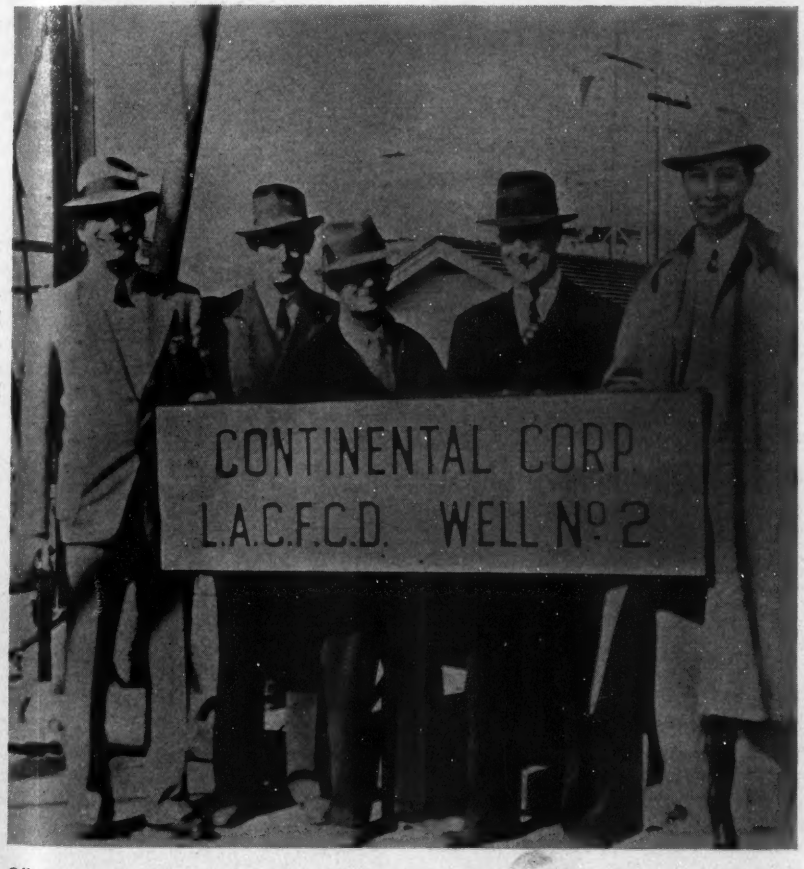
I have been asked, as counsel for Continental Corp., to contribute an article outlining some of the problems which confronted my clients in seeking to drill the Flood Control property in Long Beach. This is an attempt to comply with that request, keeping away from technicalities, and avoiding references to precedents. I have found the assignment not a little troubling in trying to cover technical legal problems in lay language and without resort to citations and authorities.

Continental Corp. after the execution of its Drilling and Operating Agreement with the Los Angeles County Flood Control District, about a year ago, was faced with the absolute prohibition contained in several ordinances of the City of Long Beach, against drilling the District's property, although by the terms of the agreement surface operations were confined to the westerly sixty feet of the seventy-five foot west bank of the channel right-of-way.

In 1937, after the discovery and development of the Wilmington field, the voters of Long Beach, by initiative, amended their 1927 zoning ordinance so as to allow drilling in the Harbor District, west of the west line of the Flood Control right-of-way, but continued the previous prohibition against drilling in the rest of the city, south of Signal Hill, thereby excluding the Flood Control property at the east end of the field, from drilling. With ensuing development of the field, one well was drilled less than twenty-five feet from the District's property and several more at distances less than sixty feet.

Continental Corp. and the District joined in an action against the City of Long Beach, last June, the primary object of which was to obtain an injunction against the enforcement by the City of its ordinances forbidding the drilling of the property.

George H. Emerson



Officials at the Los Angeles County Flood Control's first well. Left to right: Robert V. New, Vice-Pres. and General Manager, Continental Corp., Larry M'Closkey, Macson Oil Co., Drilling Contractor, Benny Livesay, Drilling Superintendent, R. F. Ingold, President Continental Corp., Al M'Closkey, President Macson Oil Co.

The plaintiffs, in attacking the ordinances, were faced with the general rule that every intendment is to be made in favor of zoning ordinances, and that the court will not, except in clear cases, interfere with the exercise of the power as manifested by the ordinances, and that if, broadly considered, there is a reasonable basis of classification, the court will not substitute its judgment for that of the municipal authorities. Our main reliance, of course, was in the rule that in the final analysis it is always a judicial question whether any particular regulation of the right to engage in a useful business enterprise is a valid exercise of legislative power; and that if any such legislation is unnecessary to protect the public health, safety, or welfare, or if a classification it establishes is discriminatory or unreasonable, then as to the property or business in question, the enactment is void.

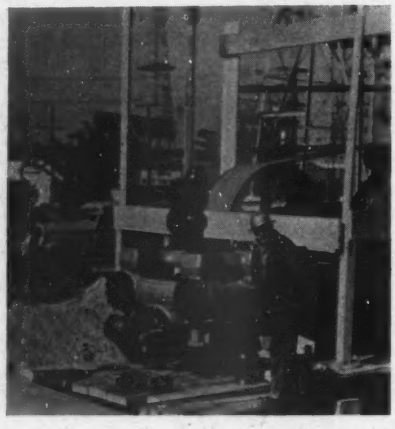
To establish this theory, it was necessary for us to prove the lack of conditions which would reasonably justify the resort by the City to the extreme measure of its police power, that of the absolute prohibition of drilling on the District's property.

The City contended that there was such a difference in character between the District's property and that adjoining it on the west as to justify the dis-

Right: Lunch time brings provender and dessert to the worker in the Long Beach Harbor field who forgets his lunch basket. Clean white levee at the left of channel will soon be dotted with oil wells. This is a view from Continental Corp.'s first well, the successors to which will string out up stream.

tinction they had drawn, and introduced evidence in an attempt to prove, among other grounds, the increased hazard from flood waters to wells on the channel bank, the greater likelihood of pollution from such wells, the danger to inter-urban passenger and freight traffic because of the proximity of railroad lines to the locations of the proposed wells, the detriment to property situated in the residential area east of the channel by the location of the wells on the west bank, and that locating wells along the channel bank would impede flood control operations, particularly in times of flood.

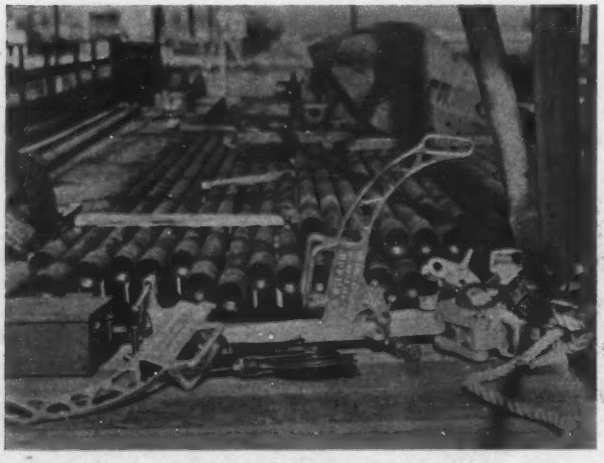
We proved to the satisfaction of the Court that the boundary line as fixed by the ordinances did not form a reasonable boundary, nor a natural barrier, and that it was not occasioned by reason of any existing or reasonably expected future use of the lands; that existing wells on property owned by the defendant City were situated as close to railroad tracks used for freight trains as the wells proposed to be located by Continental Corp.; and that there were other areas in the Harbor District where it was possible to locate wells as close to the railroad lines

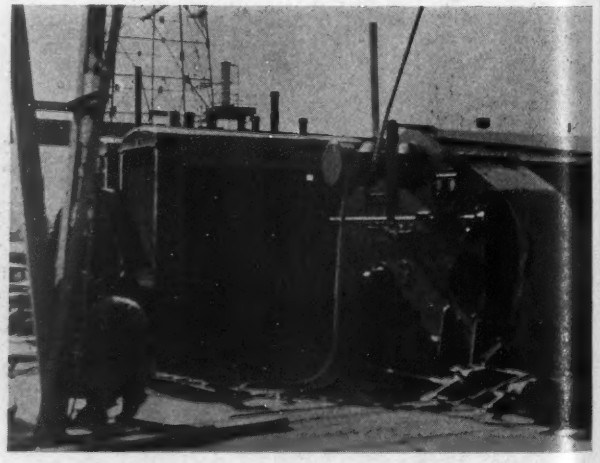


Mud pumps are important adjuncts to drilling and these look capable of a good job.

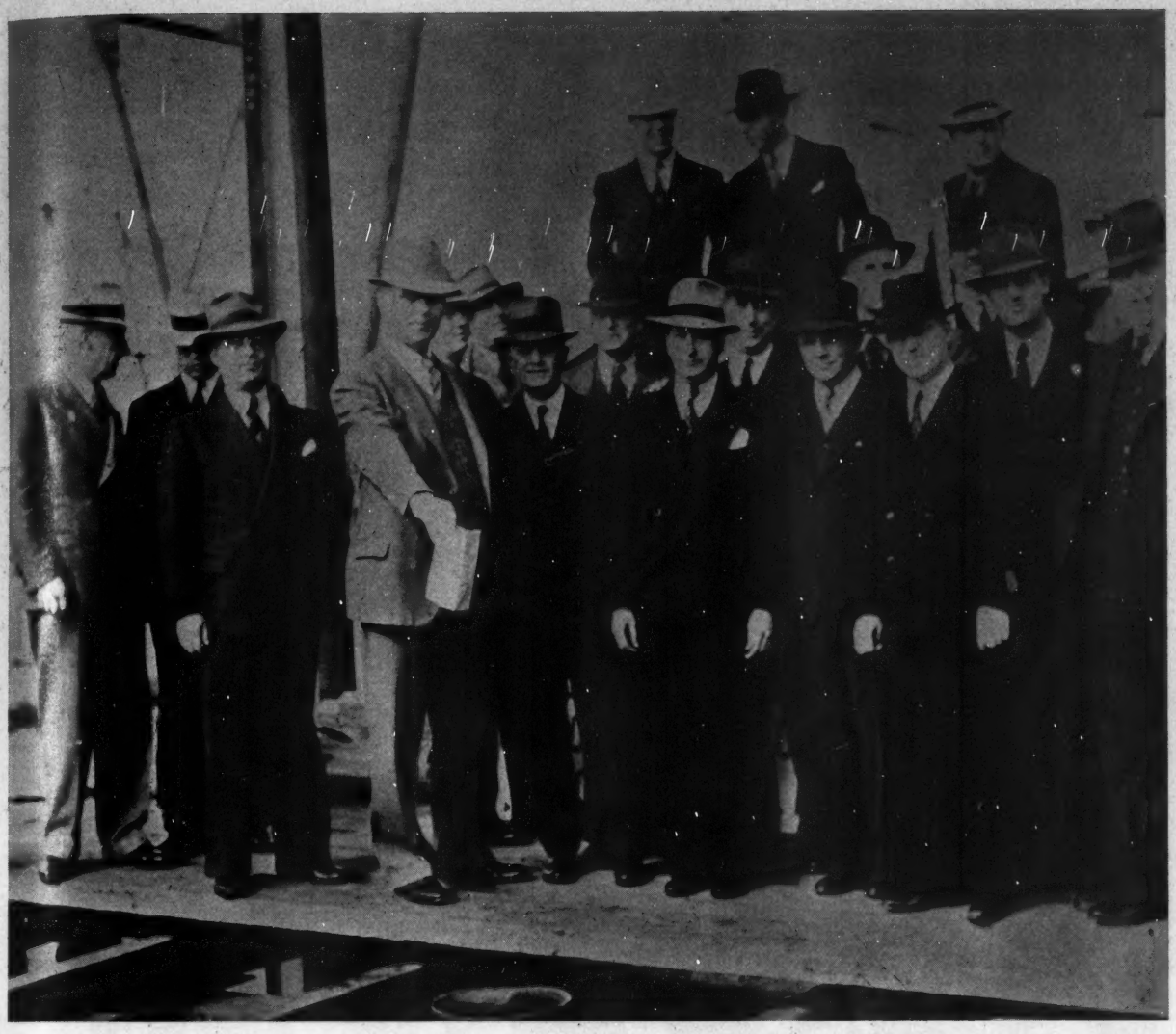
used for both freight and passenger traffic as the locations proposed by Continental, without any attempt on the part of the City to zone those areas against such well locations.

The Court found that any increased hazards because of the proximity of wells to railroad lines could be eliminated by additional care in the conduct of operations; that there were wells drilled as close or closer to the water in other parts of the Harbor District than we proposed to drill to the channel; that there were wells located far closer to buildings than the wells Continental planned; that there was much greater danger from loss of control of oil or gas from wells in other parts of the Harbor District than from Continental's wells; that wells on the west channel bank would not preclude or prevent the maintenance of the banks for flood control purposes; and that Continental's wells being more than seven hundred feet from structures to the east of the channel





Right: Hooking up the power drive on the latest Harbor driller. Left: Part of the all new equipment which "Oilwell" supplied the Macson Oil Co. to drill a series of wells up the west bank of the Flood Control Channel in Long Beach Harbor.



Representative portion of officialdom who subscribed to bag of pennies which Supervisor Wm. A. Smith is about to drop in the yet undrilled casing. Left to right, top row: Martin Moxley, John Kelly and Bill Brunton: bottom row: Herbert Klocksiem, Harvey Freeman, Roy Dowds, Bill Smith, Frank Herbert, Frank Parr, Jack Charleville, John O'Conner, Harry Albert, R. F. Ingold, George Emerson, Curtis Clark, Irving Smith, Warren Lamport, Irving Carroll and Frosty Martin.

would not involve property there.

The Court made the conclusion that the City's ordinances, so far as they attempted to forbid the drilling of the District's property, were unreasonable, arbitrary, and discriminatory and were invalid as to the plaintiffs, and granted a permanent injunction against their enforcement.

The trial of the case presented a great many other interesting problems, some connected with the issues which I have touched upon here, and many others in connection with the number of collateral issues involved in the action. To attempt even to outline them in this article would expand it into a wordy missive as voluminous as one of those efforts which we attorneys naievely call a brief. It were better that the plaintiffs rest.

Continental Corp at Last Drilling Flood Control Bank

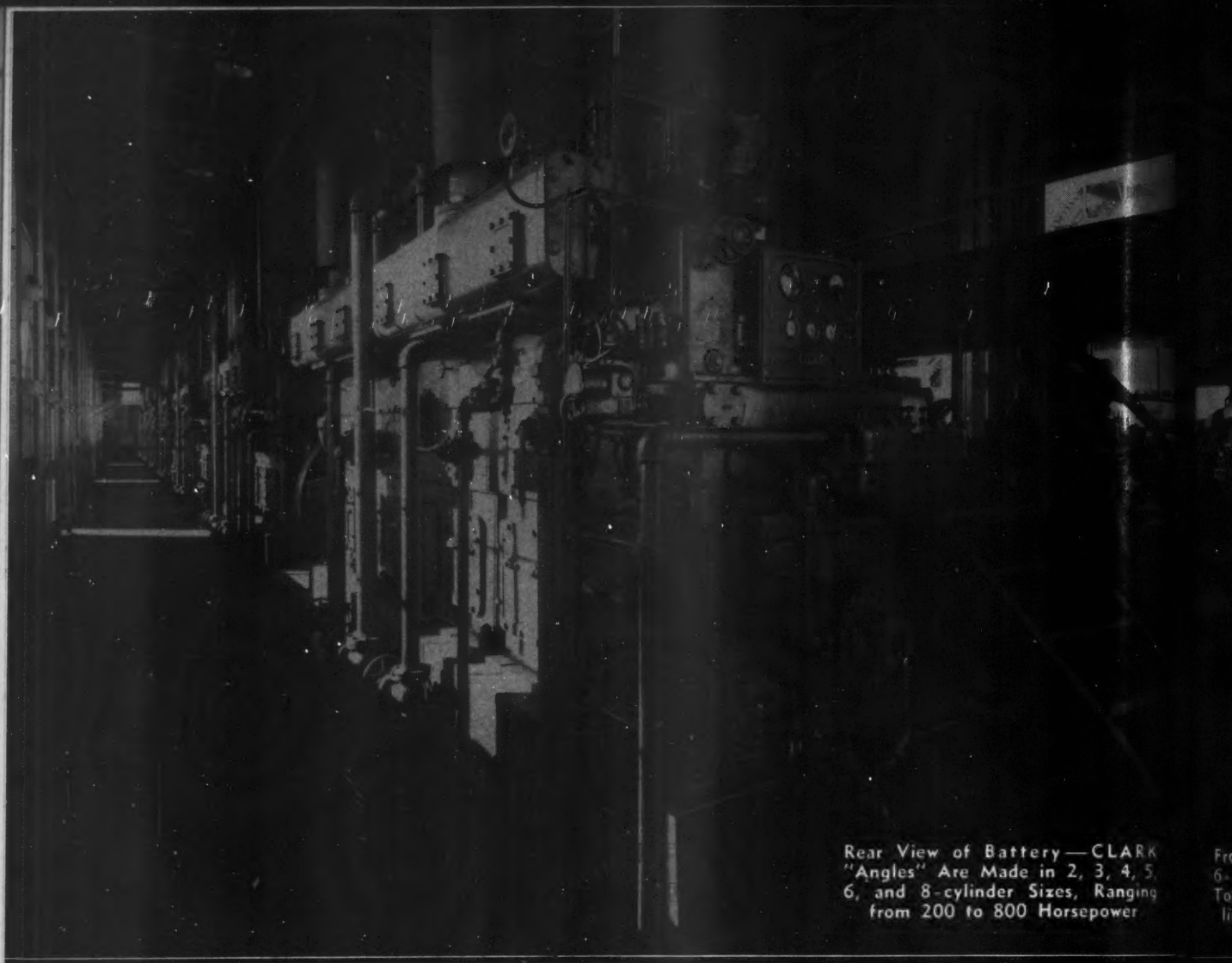
Culminating a 17-month delay, occasioned by many legal ramifications, Continental Corp. nears completion of L. A. C.F.C.D. No. 2, the first well on the west bank of the county flood control channel in the City of Long Beach.

Formed by R. F. Ingold and Robert V. New for the purpose of developing the 100 acre county property, Continental Corp. let the actual drilling contracts to the Macson Oil Co.

Realizing that the many wells to be drilled along the channel would require a maximum of efficiency and speed, Al M'Closkey, president of Macson Oil Co., and Larry M'Closkey, official of Macson and drilling contractor on this project, placed an order with Jack Manildi of Oil Well Supply Co. for a complete new drilling rig.

Using a new streamlined Model "R." draw works, manufactured by Portable Rig Co. Inc. of Houston, Texas, powered with two 185 horsepower Waukesha-Hesselman engines along with drilling accessories of the latest type, the new outfit is the first all new equipment to be used locally in a long time. The words "all new" are used advisedly since not a piece on the rig ever made a foot of hole prior to spudding of No. 2 on Jan. 19.

Operation costs are to be held down by using butane fuel on the first hole, and lease gas through a scrubber on all later projects. Change of fuel is facilitated by the character of the engines



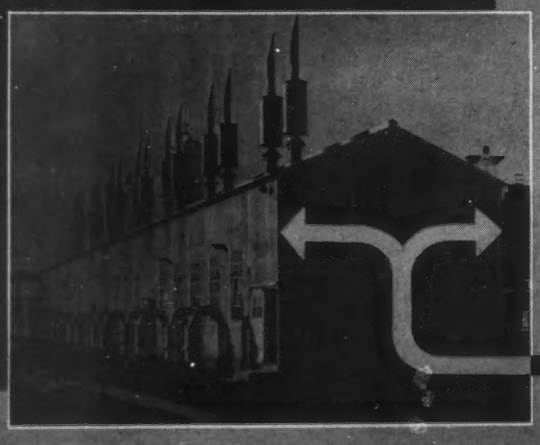
Rear View of Battery — CLARK "Angles" Are Made in 2, 3, 4, 5, 6, and 8-cylinder Sizes, Ranging from 200 to 800 Horsepower

NEWEST MAJOR

7 CLARK 6-Cylinder "Angle

One of the world's largest natural gasoline plants has just been com pleted in the Wasson-Bennett Field, West Texas. The compressor installa tion in this plant—here shown—is the largest of its type ever made. It consists of 7 CLARK 6-cylinder, 600 H.P. "Angle" Compressors, totalling 4,200 H.P., and the battery's capacity is rated at 24,000,000 cu. ft. of gas per day.

Two features of this installation are of special interest: (1) It has been designed for exceptional flexibility and can operate at intake pressures from 2 pounds to 10" vacuum, so that as the field depletes and pressure falls off, there will be no necessity of changing the compressor cylinders. (2) The battery is equipped with full automatic pressure regulation and speed control, to take care of the irregular or "surging" gas flow in this area.



This building houses the battery above pictured. CLARK "Angles" can be installed in buildings only 24 feet wide

CL

Front View, Battery of 7 CLARK 6-cylinder "Angle" Compressors Totalling 4,200 H.P. in new Gasoline plant, Wasson-Bennett Field

GASOLINE PLANT

totalling 4200 Horsepower

CLARK "Angle" Compressors are being selected for such leading installations for two basic reasons: 1. In nearly 4 years on the market, their performance has proven equal in every respect to that of the famous CLARK 2-cycle Horizontal Compressor; 2. They have introduced four basic economies, as compared with horizontal compressors: a. Lower transportation and erection costs; b. Smaller foundations and floor space; c. One-third fuel saving, due to CLARK Super-2-Cycle Fuel Injection; d. Lower maintenance due to extreme mechanical simplicity. You should thoroughly investigate these savings.

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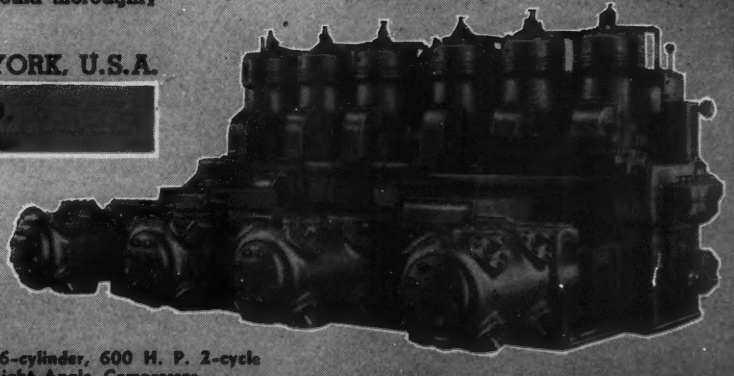


CLARK 6-cylinder, 600 H. P. 2-cycle Right-Angle Compressor

which will burn butane, natural gas or gasoline fuel at option.

Actual drilling operations were preceded by a christening, at which all concerned contributed pennies to be dropped down the virgin surface pipe. Representing the county were: Supervisor Wm. A. Smith, Roy Dowds, Flood Control District counsel, John H. O'Conner, county counsel and Wm. B. McKesson, chief trial deputy county counsel.

The board of Long Beach Harbor Commissioners was present in the persons of: Frosty Martin, chairman, Warren Lamport, Frank Parr, Frank Herbert and John Kelly.

Francis Gentry, mayor of Long Beach, accompanied by his fellow councilmen, Carl Fletcher, Stephen Ford, Herbert Klocksiem, Harvey Freeman, E. Curtis Clark, Irving Carroll, Martin Moxley and William Brunton along with Jack Charleville, city manager, and Irving Smith, city attorney, represented the municipality.

Continental Corp. officials, hosts at luncheon to all participants were: R. F. Ingold, president, Robert V. New, vice-president and general manager, Geo. H. Emerson, general counsel and Harry Albert, special Long Beach counsel.

Situated as it is, at the easterly limits of Harbor production, with undetermined drainage to the south and east, the lease is expected to yield greatest revenues to the County Flood Control District. Operators promise to develop the publicly held lands with the greatest dispatch compatible with the best public interests.

Price Cut Hits Ranger Zone Wells

One of the hardest hit group of operators is that embracing the Ranger Zone producers at Wilmington. With the crude price reduced 15c a barrel, the margin of operating profit is very nearly wiped out and an abrupt drop in drilling activity is anticipated.

One of the best recent Ranger completions is Bond Petroleum Co.'s Star Drilling No. 1, finished at 3335 ft. flowing an estimated 250 bbls. of 15 gravity oil. The well is located south of Wilmington Blvd. and west of Pico Ave.

Terminal Zone wells were finished by Hancock Oil Co. and Union Pacific Railroad in the central portion of the field.

Long Beach NW Well Rigging Up Gas Lift

After establishing a natural flow rate of only 100 bbls. a day, Long Beach's most northwesterly well is being rigged to flow by gas lift. The hole is finished at 7675 ft. after plugging from 8400 ft., the deeper sands being too gray looking to warrant a test. Casing was cemented at 7600 ft.

Within the main part of the Long Beach field, activity is largely confined to the 3500 ft. zone which has resulted in the bringing in of several nice wells.

Allied Petroleum Corp.'s "Jerman" zone well, No. 34, is drilling at 8150 ft.

News and Views Around the Derricks

Cold weather brings a lot of trouble, including gas hydrates which choke the fuel supply, but these boys are drilling ahead on Standard Oil Co.'s No. 20-2 in Cole's Levee. Left to right they are: Charles Davis, Marvin Bramham, Ted Bachman, V. V. Boyce, and George Rice, driller.

Putting down Standard Oil Co.'s No. 42-19F in new East Coalinga Eocene pool play, Sec. 19, 20-16, are right to left: Earl Crawford, driller; Al Bivens, John Cummings, William Crawford, and Eldom Easter.

Drilling No. 5-7F for Robert S. Lytle in the East Coalinga Eocene field, Sec. 7, 20-16, are, left to right: Hank Tisdale, Swede Peterson, Herb Page, Paul Jones, and Frank Gibson, driller.

Reservoir Anticline Wildcat Is Spudded In

Continental Oil Co., getting under way late in January, is now drilling its important test of Reservoir Anticline in the northwesterly portion of San Fernando Valley (see map on pages 20 and 21). Delayed by the heavy rains, progress has been slow so far and the formations, even at present bottom of 1350 ft., are very hard.

Continental Again Drills Shafter Area

Resuming development of the deep zone prospects in the Shafter area, in which it has for some time played the stellar role, Continental Oil Co. is drilling Community No. 1 below 7500 ft. Located in sec. 12,28-24 on a line extended southeasterly from Wasco's deep production, the current driller is the latest of a series of deep tests jointly financed by large leaseholders in the district.

Consolidated Tests Newhall Deep Well

One of the most interesting and important tests of a California oil well is soon to be made in Needham No. 4, deep Newhall well of Consolidated Petroleum Co. Bottomed at 4300 ft., this well has penetrated the geologic column farther than any other in the area. The Upper Miocene section was missing, the drill having passed from Middle Pliocene to Middle Miocene at 1800 ft., and then into the Upper Meganos of the Eocene at 2500 ft., the intervening sediments being absent.

The Eocene sand, though rich in oil showings, is very low in both porosity and permeability, the former being only 12% while the latter is slightly under two millidarcies; which according to laboratory experiments is too low to allow the fluid to escape from the sand at a commercial rate.

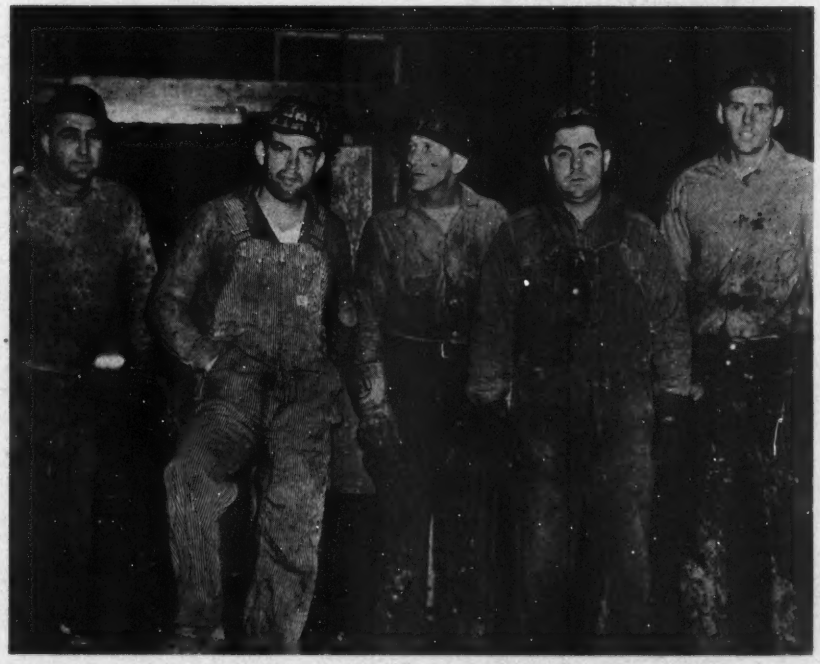
After several weeks of consultation and checking, the operator decided to risk a string of casing on the chance that nature does not always perform according to the ideas of man and 5¾ in. pipe is now cemented at 4040 ft. in preparation for the production test.

Western Gulf Tests Paloma Field Sands

Western Gulf Oil Co., co-discoverer and joint lease holder with The Texas Co., is preparing to complete its second Paloma field well. Located a third of a mile east of discovery in sec. 3,32-26, the well, KCL No. A-74-3, when tested had 270 ft. of good oil sand open to bottom at 10,422 ft. On a 55 minute formation test flowing through a 28/64 in. bottom hole bean and a 48/64 in. surface bean, the well made an 852 barrel rate of 47 plus gravity oil with gas at a 35,000,000 cubic foot rate.

Determined to completely examine the Stevens zone at this point, operators have cored ahead in hard Cherty shale to 10,435 ft.

A few hundred feet northwest of the discovery well, near the center of section 3, Ohio Oil Co. KCL No. B-2, only other driller at present, is at 9727 ft. in hard shale.



Drilling ahead after thawing out the gas lines to Shell Oil Co.'s No. B-81-17, in Cole's Levee, are, left to right: James Peterson, driller; William Gaines, G. E. Ingraham, Robert Culp, and Wilson Call.

Deviation of Natural Gas at High Pressures

Useful Charts on Gas Behavior

C. N. G. A. Meeting February

By J. N. Smith,

Standard Oil Company of Calif.
Research and Development
Department

The development of high pressure processes involving natural gas has made it imperative to know the properties of gas mixtures under high pressure conditions. Of these properties, one of considerable utility is the deviation from perfect gas behavior. Deviation factors of natural gases at high pressures are required in connection with calculations of volumes of underground mixtures of gas and oil and in metering gases used in repressuring and gas-lift operations. For this work, a method for estimating deviation at pressures of several thousand pounds per square inch was desired.

Up to pressures of 500 lbs./sq.in. the deviation of natural gases has been very satisfactorily correlated on a specific gravity basis[1]. At higher pressures, the deviation curves for the individual components, such as methane, ethane, etc., lose their symmetrical relationship, indicating that a specific gravity correlation would not be reliable. It was evident, therefore, that another method of approach would be necessary.

Correlation Of The Deviation Of Pure Hydrocarbons With The Critical Point:

It has been shown[2,3], that deviation curves for different hydrocarbons could be correlated by employing reduced temperature (ratio of actual temperature to the critical temperature) and reduced pressure, rather than the actual temperature and pressure. On a reduced basis, the deviation curves for the individual hydrocarbons coincide reasonably well throughout the entire pressure range for which experimental data are available. This generalization accomplishes the same thing for pure components through a wide pressure range that the specific gravity relationship did for mixtures up to 500 lbs./sq. in. Figures 1 and 2 show the curves obtained when the compressibility data for the light hydro-carbons are plotted on a reduced basis. On these charts, the data have been expressed as supercompressibility

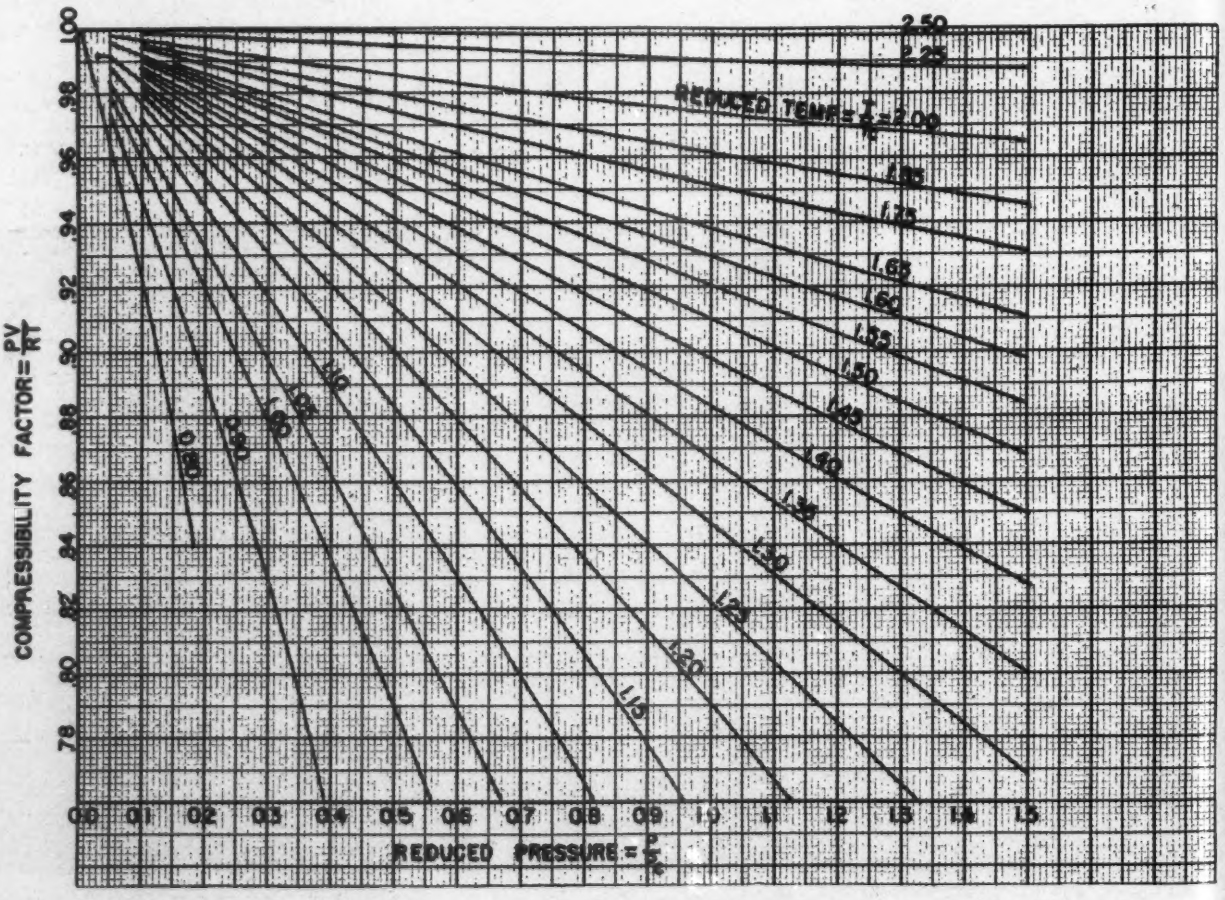


Figure 1. Compressibility of the light hydrocarbons in low pressure range.

factors. This type of presentation is convenient when the volume under actual conditions is desired. In gas metering, the volume at atmospheric pressure is usually desired; hence, the deviation is expressed as superexpansibility factors.

Correlation Of The Deviation Of Mixtures With The Pseudo-Critical Point:

Figures 1 and 2 are based upon experimental data for single hydrocarbons. To apply to mixtures, a suitable critical point must be used to calculate the reduced temperature and pressure. Kay[4] found if the actual critical point of the mixture is used for this purpose, the curves do not coincide with those for pure components. He defined the correct point to be the critical of the hypothetical pure component having the same P-V-T relations in the gaseous region as the mixture, and called it the pseudo-critical point. For gases consisting of the light hydrocarbons, this pseudo-critical point may be determined from an analysis of the gas by adding the critical of each component in proportion to its mol fraction in the gas.

The Deviation Of An Actual Gas:

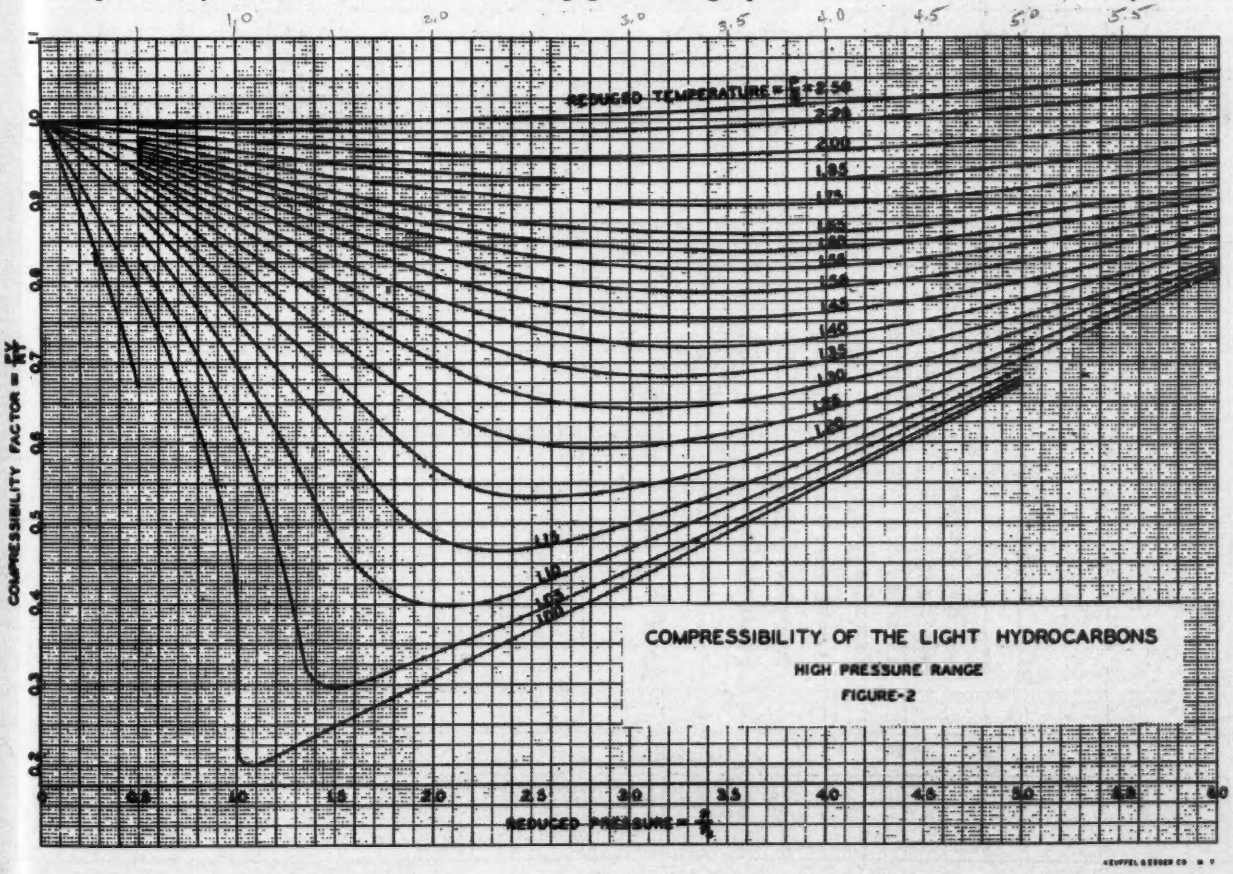
Figure 3 is illustrative of the type of deviation computed for an actual gas by this method. The curves were obtained by evaluating the pseudo-critical point from the fractional analysis, and then reading compressibility factors from Figures 1 and 2 at a series of pressures and temperatures. The data have been converted to superexpansibility factors, arbitrarily taken equal to unity at 14.73 lbs./sq.in., in order to conform with metering practice. The factors shown apply for displacement meters. For orifice meter factors, the square roots of these values would be used. Figure 3 shows that at normal temperatures, gases of this nature, containing about 80% methane, exhibit deviations as high as 30% at pressures of 2000 to 3000 lbs./sq.in.

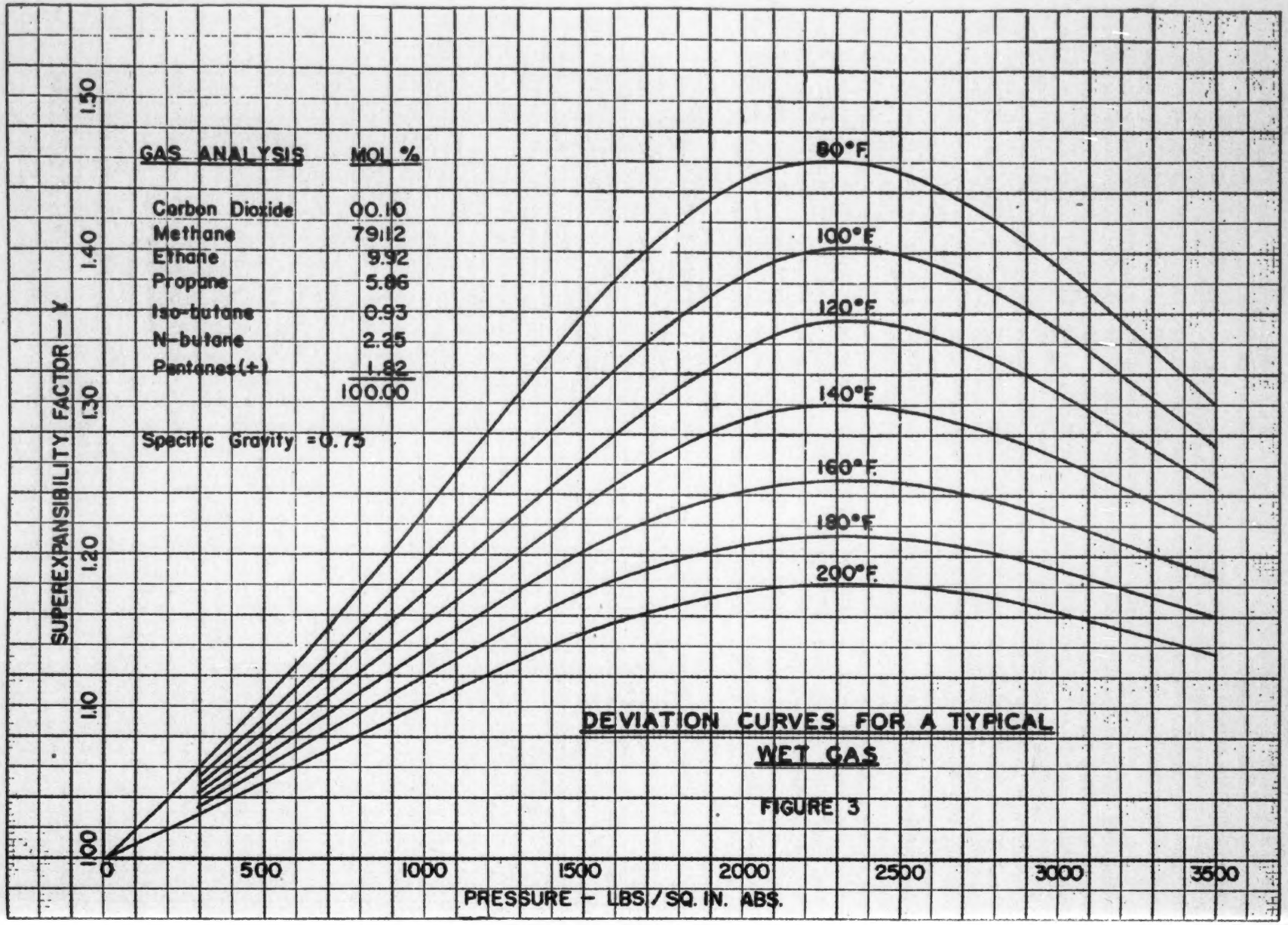
Effect Of Condensation:

In metering gases at high pressures, the possibility of condensation must be considered. Gases which do not condense at a few hundred pounds per square inch pressure may show appreciable condensation at 1500 lbs./sq.in. In dealing with gases of this nature, the metered volume will not be that of the total gas if no condensation had occurred. One way of arriving at the total volume would be to measure the liquid condensate in an accumulator at the meter and add its equivalent gas volume to the metered volume. The same results could be computed provided suitable equilibrium relations are available for the gas. In fact, corrected deviation curves could be prepared that would indicate factors for determining both the volume of the metered gas and the total volume. However, the critical points of natural gases are such that equilibrium relations may be only approximated at high pressures.

Accuracy Of The Pseudo-Critical Method:

To indicate the accuracy of the





DEVIATION CURVES FOR A TYPICAL WET GAS

FIGURE 3

CALIFORNIA OIL WORLD AND PETROLEUM INDUSTRY, FIRST ISSUE, FEBRUARY, 1940

SUPEREXPANSIBILITY FACTORS UP TO 500 LBS./SQ.IN. FOR THE GAS SHOWN IN FIGURE 3

Pressure #/Sq.In.Abs.	80°F.		120°F.		160°F.	
	C.N.G.A.	Calc.	C.N.G.A.	Calc.	C.N.G.A.	Calc.
14.7	1.000	1.000	1.000	1.000	1.000	1.000
100	1.020	1.019	1.016	1.015	1.013	1.012
300	1.069	1.065	1.053	1.050	1.041	1.039
500	1.117	1.116	1.090	1.086	1.071	1.066

SUPEREXPANSIBILITY FACTORS FOR A REFINERY GAS[4]

Gas Analysis-Mol.%		Temp. °F.	Pressure - Lbs./Sq.In.Abs. 650#		975#	
			Exp.	Calc.	Exp.	Calc.
Air	.70					
Methane	7.06	455	1.090	1.098	1.137	1.150
Ethylene	5.10	394	1.124	1.130	1.190	1.205
Ethane	24.90	333	1.162	1.180	1.290	1.290
Propylene	22.05	272	1.266	1.262	1.470	1.472
Propane	30.92	210	1.456	1.440		
Butylenes	5.85					
Butanes	3.42					
	100.00					

SUPEREXPANSIBILITY FACTORS FOR MIXTURES OF METHANE AND PROPANE[5]

	Mol. Per Cent Methane									
	20		40		60		80			
Temp.,°F.	194°F.		194°F.		194°F.		68°F.		194°F.	
Pressure #/Sq.In.	Exp.	Calc.	Exp.	Calc.	Exp.	Calc.	Exp.	Calc.	Exp.	Calc.
735	1.815	1.756	1.332	1.313	1.144	1.160	1.215	1.211	1.096	1.084
1470	2.538	2.563	1.834	1.782	1.320	1.346	1.531	1.507	1.167	1.159
2060			1.799	1.763	1.378	1.416	1.605	1.582	1.217	1.187
2650							1.528	1.500	1.209	1.190

[4]Kay, Ind.& Eng.Chem. 28, 1014 (1936).
[5]Sage, Lacey and Schaafsma, Ind.& Eng.Chem. 26, 214 (1936)

deviation factors computed by this method, comparisons have been made with the available experimental data for gas mixtures.

First, a comparison of the computed superexpansibility factors for the gas shown in Figure 3 with the corresponding results obtained from the C.N.G.A. specific gravity relationship is given in Figure 4. The average divergence here is 0.2%.

Kay[4] measured the deviation of refinery gases up to 1000 lbs./sq.in. An analysis of a typical gas which he studied, together with the experimental and computed superexpansiblity factors, are shown on

FIGURE 4

Figure 4. The average difference between the results is 0.6%.

Lacey and associates[5] have published experimental P-V-T data for mixtures of methane and propane at pressures approaching 3000 lbs./sq.in. This information, converted to superexpansibility factors, is also compared with computed factors in Figure 4. The average deviation in this case is 1.5%, and the maximum 3.4%.

From these comparisons, it is concluded that the pseudo-critical method may be used to calculate deviation for natural gases up to pressures of several thousand pounds per square inch with an accuracy sufficient for most purposes.

Partial Volume Method:

Sage and Lacey[6] have recently offered another approach to the problem of predicting the volumetric behavior of gaseous hydrocarbon mixtures. It is based upon the available experimental partial specific volume of the important constituents of the gas as functions of temperature, pressure and composition. The method appears to be potentially superior since it is based upon exact principles in contrast to the somewhat inexact law of corresponding states and procedure for estimating the pseudo-critical point used in the psuedo-critical method. However, the present lack of complete partial volume data necessitates simplifying assumptions so that its application is limited to pressures of 3000 lbs./sq. in. A brief study at lower pressures indicates it to be of approximately the same accuracy as the pseudo-critical method. It would be expected that the accumulation of additional experimental data would increase both the scope and accuracy of the partial volume method.

1. *Superexpansibility Factors in High Pressure Gas Measurement, California Natural Gasoline Association Bulletin No. TS-354.*
2. *Cope, Lewis and Weber, Ind. & Eng. Chem.* 23, 887 (1931).
3. *Brown, Souders and Smith, Ind.& Eng.Chem.* 24, 513 (1932).
4. *Kay, Ind.& Eng.Chem.* 28, 1014 (1936).
5. *Sage, Lacey and Schaafsma, Ind.& Eng.Chem.* 26, 214 (1936).
6. *Sage and Lacey, Paper presented at Twentieth Annual Meeting, A.P.I., Nov.* 17, 1939.

Rowena Flows 250 B/D In Rosecrans Extension

Southern California Petroleum Corp.'s Rowena No. 1 was the sixth well to be completed in the new southerly extension of the Rosecrans field when it was swabbed in flowing 250 bbls. a day. The hole was bottomed at 7465 ft. with 165 ft. open below the shoe of the 7 in. casing. Characteristic of the area, gas yield is quite low, being estimated at 275,000 cu. ft.

Barnsdall-Wilshire Santa Fe Corp. No. 1, the most easterly well, is flowing about 100 bbls. a day of fluid cutting 30-40%. Perforations are open in the water string below 8340 ft.

Apex Petroleum Corp. is drilling and coring Hatfield No. 1, southerly well, near the 8700 ft. level and is expected soon to set casing for a production trial.

Modified Composition Analysis Application

To Absorption Plant Control

C. N. G. A. January Meeting

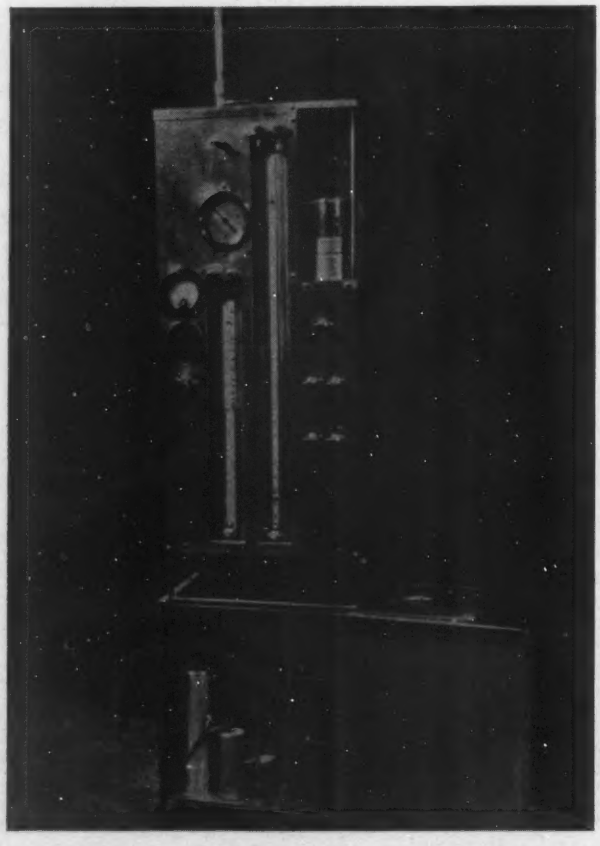
H. P. Saueressig
Signal Hill Laboratory
The Texas Co. (California)

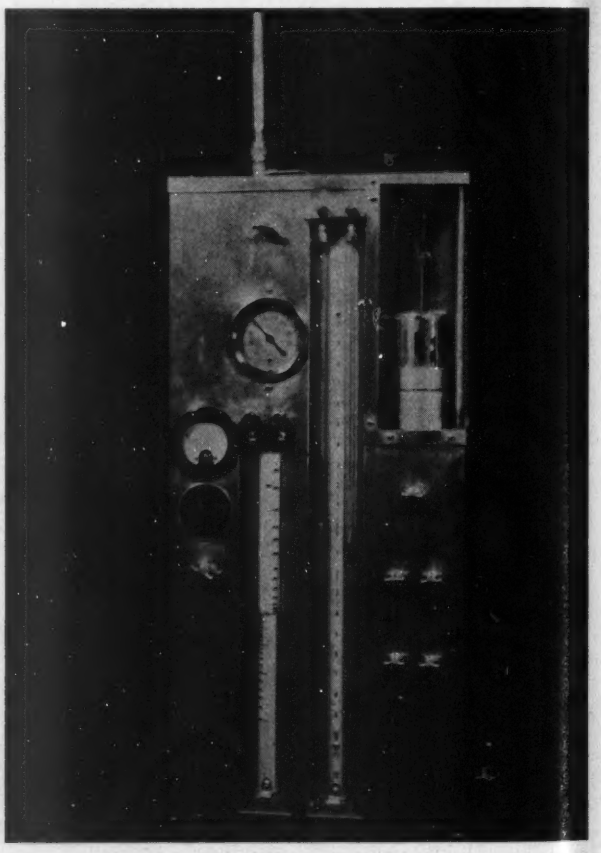
In a previous article[1] presented before this Association F. N. Laird of The Texas Company described a portable, practically all metal apparatus designed for the rapid low temperature analysis of light hydrocarbon gases, liquids and vapors. Essentially, it consists of an aluminum, kapok-insulated column with a double spiral packing. The dimensions of the column approximate those of the glass unit standardized by this Association[2]. The distilling pots used are interchangeable and are attached to the bottom of the column by means of male aluminum joints fitted to the female half of standard tapered ground glass joints which are sealed to the pots.

A gasoline and solid carbon dioxide mixture is used as a refrigerant in the vapor condenser at the top of the column and also around the distilling pot for partial condensation of the sample during introduction. Depending upon the type of material tested (gas, vapor, etc), the adjustment of the pressure in the column serves to regulate the percentage condensed of the various samples encountered. Gaseous samples which yield small volumes of condensate are taken directly into the apparatus after passing through a suitable drying agent contained in a unit connected directly to the sample source. Samples yielding large volumes of condensate can be introduced without the use of drying agents. This procedure is followed except in cases where the gas or vapor under examination may vary in composition over comparatively short periods of time. In these instances, the samples are taken first into bombs, from which they are transferred to the apparatus for analysis. Ordinarily, liquids are taken in bombs for subsequent transfer to the apparatus because these samples are usually obtained over considerable intervals of time.

The purpose of this paper is to describe results obtained by application of the device over a two-year period to analyses of a wide variety of gases, liquids and vapors in connection with absorption plant control. In presenting this discussion, the point should be kept in mind that this method is not designed to replace the conventional form of low temperature-fractional-analysis-in-glass apparatus, but rather to extend the use of this important type of procedure by means of a short cut method which affords not only substantial savings in time, but also permits analysis to be made directly at the sample source.

The first questions to enter the mind of one interested in plant analysis will be: (1) Is this short-cut method as accurate as the conventional analysis? (2) Is it cheaper? (3) What is the original cost of the unit? (4) When a conventional unit is already installed and operating, how many tests with the portable unit must be made before the savings realized pay for the instrument? (5) What is the time required for an average analysis? (6) Is it a flexible method adaptable to all conditions encountered in low temperature gas and





Left: Front view of modified composition analysis apparatus; right, top of apparatus, showing compound gauge, manometers, condensate receiver, heater control and manifold valves.

Three types of pots used; left to right: liquid, wet gas or vapor, and absorber discharge gas.

gasoline analysis? Those who think in terms of conditions peculiar to their own operations, of course, will ask other and more specific questions. However, only answers to the questions mentioned will be developed in this discussion in order to cover the subject in as broad a manner as possible.

Accuracy, being of greatest importance, is given first consideration. Numerous comparable analyses have been made on the portable and conventional apparatus and many dry gas tests have been made simultaneously using the portable unit as compared to the rectified charcoal method[3]. These results indicate that the portable unit provides a reasonably accurate method for isobutane and normal butane separation. Pentane+ values shown for the rectified charcoal tests were derived by multiplying rectified test results by 0.75, the assumption being that the rectified charcoal test condensate contains 75% pentanes-plus.

At the present stage of development, the portable unit is not considered acceptable for the separation of hydrocarbons lighter than isobutane. In most cases, pentanes-plus determinations have proven to be as accurate as those made on the conventional glass apparatus. Wet gas and dry gas analyses by the conventional method present problems which are overcome largely in the portable unit; namely, the size of sample may be conveniently adjusted to the type of analysis, and the possibility of adsorption of heavier hydrocarbons by drying agents and by metals used in sample bombs in most cases is eliminated. By adjusting the percentage of sample condensed during introduction, it is made feasible to recover 2 or 3 ml. of pentanes-plus from a wet gas sample and 1 or 2 ml. from a dry gas sample. This offers an advantage, especially in the case of dry gases, because larger amounts of pentanes-plus make for better separation than is possible with the amount of residue usually available in the conventional analysis.

In addition to providing a simpler and equally accurate method for pentane-plus determination, the portable unit makes available a more detailed and rapid examination of pentane-plus residues. As mentioned before, by adjusting the percentage condensed and hence the size of sample introduced, it is possible to recover at least 2 ml. of residue. Since in most introductions, 95% or more of the pentanes-plus is condensed, these residues are suitable for molecular weight, vapor equivalent and vapor pressure determinations. Most natural gasoline laboratories are equipped with the apparatus necessary for these supplementary tests and inasmuch as the time required for a set of determinations seldom exceeds 2 hours, knowledge of these important properties is made more easily available than heretofore.

Wet gas test data shown in Table No. 1 were obtained from six Santa Fe Springs tests. Each set of samples was passed thru one drying train. The sample for the conventional analysis was condensed in a standard distilling pot which was immersed in liquid nitrogen. The sample for the modified method was partially condensed at dry ice temperature (—110°F.) in a distilling pot attached to the portable column.

Summarizing, it can be concluded that while accuracy may be sacrificed slightly in the isobutane and normal butane separation, the pentanes-plus values, especially in wet and dry gas analyses, are equal to, if not more accurate by the portable unit, than those obtained with the conventional apparatus.

The second question is cost per analysis. Because most analysts are familiar with the conventional type of apparatus and procedure, costs of analysis by this procedure have been compared with those of the modified method. These figures may be broken down into the two items, labor and materials; the labor including time for equipment upkeep, sampling, analysis and calculation of results. Essentially, materials include replacement of breakage and cost of the two cooling agents used, i.e., liquid nitrogen for conventional vs. dry ice for the portable unit. Preparation and transportation of sample containers necessary for conventional analyses have been disregarded.

The upkeep cost of the portable unit has been minimized by using an all-metal column and a manifold fabricated with high temperature solder. Once the leaks which are inherent in this type of apparatus have been eliminated, virtually no further attention is necessary. Sampling time is always variable, depending upon the circumstances attendant to any particular analysis. For all practical purposes sampling time for the two methods may be considered as equal. Because the procedure involves only partial condensation of samples which results in a material reduction of methane and ethane to be handled in the condensed sample, analysis time is greatly reduced. Corrections for losses during introduction of butanes and pentanes are made by using Murray's[4] equilibrium formula in the final calculations. Inasmuch as 90% of all analyses made are primarily for the isobutane, butane and pentanes-plus

TABLE NO. 1
CONVENTIONAL LOW TEMPERATURE FRACTIONAL ANALYSIS VS. PORTABLE UNIT

ABSORBER DISCHARGE GAS

	Isobutane, GPM		Butane, GPM		Pentanes+, GPM	
	Conventional	Portable	Conventional	Portable	Conventional	Portable
Test #1.....	0.534	0.530	0.345	0.349	0.006	0.007
Test #2.....	0.183	0.177	0.142	0.088	0.008	0.009
Test #3.....	0.133	0.140	0.136	0.133	0.016	0.014
Test #4.....	0.218	0.214	0.393	0.410	0.079	0.084

RECTIFIER VENT VAPORS

	Isobutane, %		Butane, %		Pentanes+, %	
	Conventional	Portable	Conventional	Portable	Conventional	Portable
Test #1.....	0.47	0.41	0.17	0.17	0	0
Test #2.....	12.28	11.97	10.51	10.72	0	0
Test #3.....	13.49	12.45	18.73	19.25	0	0

FINISHED PRODUCT

	Isobutane Vol. %		Butane Vol. %		Pentanes+, Vol. %	
	Conventional	Portable	Conventional	Portable	Conventional	Portable
Test #1.....	1.80	1.30	22.49	22.87	75.71	75.83
Test #2.....	1.49	1.11	21.70	21.23	76.81	77.66

WET GASES
Gasoline Content, GPM

	Isobutane		Butane		Pentanes+	
	Conventional	Portable	Conventional	Portable	Conventional	Portable
Test #1.....	0.56	0.55	0.53	0.53	0.51	0.51
Test #2.....	0.90	0.79	0.71	0.65	0.54	0.55
Test #3.....	1.68	1.60	1.40	1.40	1.11	1.18
Test #4.....	3.02	3.20	2.96	3.05	2.59	2.68
Test #5.....	8.59	8.32	7.47	7.15	5.35	5.19
Test #6.....	13.95	13.90	16.12	16.21	9.75	9.80

ABSORBER DISCHARGE GAS GPM, 20# Reid V. P. Product

	Rect. Charcoal	Portable Unit
Test #1	0.006	0.007
Test #2	0.008	0.008
Test #3	0.011	0.011
Test #4	0.012	0.011
Test #5	0.019	0.019
Test #6	0.020	0.021
Test #7	0.044	0.040
Test #8	0.055	0.052

content, it is seen that the portable unit enables an operator to reduce greatly the time spent in separation of the lighter components in which he is seldom interested.

By using curves and tables which are available, an operator can calculate the usually derived test values in less than one-half hour. Table No. 2 shows relative costs of typical gas, vapor and liquid analyses. These figures are based upon cost records for conventional analyses and are felt to be representative of typical laboratories doing this type of work.

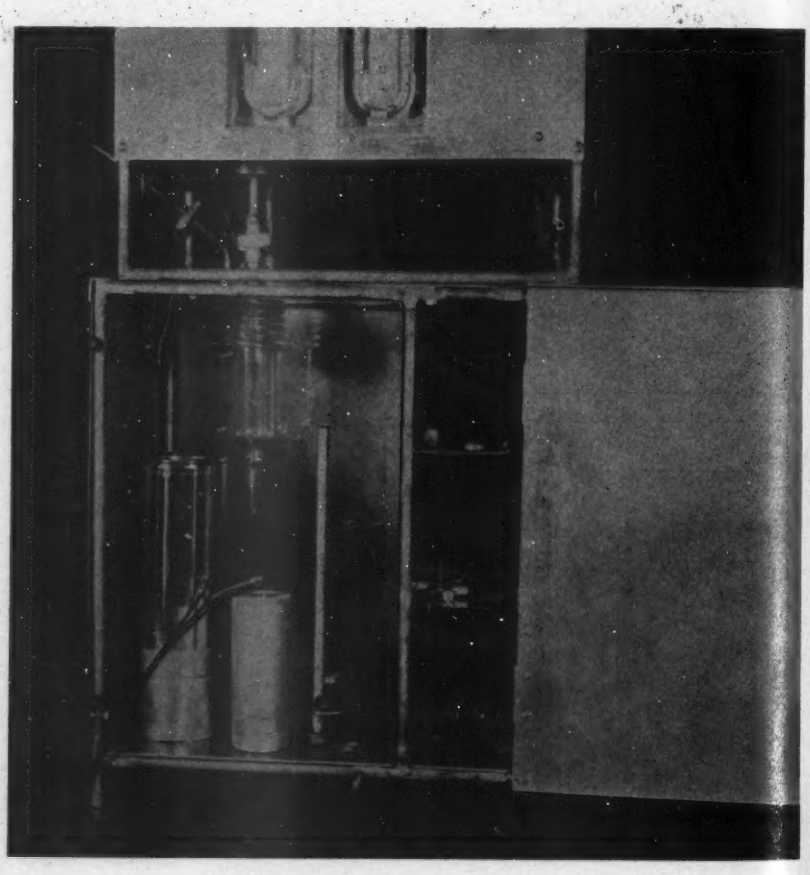
It is seen upon examination of table No. 2 that the question is answered as to the time required for an analysis. This brings up a point which is sometimes of importance and one that most of us has heard many times. That is, "how soon can we have the results?"

Assuming that there is only one man available for the work and that he has only one conventional fractionating column at his disposal, a complete plant survey report could hardly be expected sooner than five days after the work is started.

One man, using the portable apparatus, can analyze an absorber discharge gas, rectifier vent vapors and finished product in eight hours working time. Allowing 4 hours for the calculation of test values, volumes of materials handled in plant and other pertinent data, it is reasonable to expect that a complete report would be available the day after the tests were started. When only a single analysis is required, results from the portable unit are usually calculated as soon as the test is completed. In such instances, results are complete not later than two or three hours after the sample is taken.

Going on to the next two questions, we find, of course, that the original cost and payout of a unit are closely related. A portable unit fully equipped for plant work is available for $350. Payment may be calculated by any one of several methods but in an effort to cover most applications it probably should be computed on the basis of individual analyses required. It is also well to keep in mind that these figures are set up with the assumption that a conventional apparatus is on hand and available for use.

Striking an average anticipated saving of $18.90 per absorber discharge gas analysis, it is found that the portable unit will pay for itself in the course of seventeen such analyses. For rectifier vent vapor analyses, an average saving of $19.75 per analysis is netted. Thus, sixteen such analyses will offset the investment cost. As shown in table No. 2,



Bottom portion of apparatus, showing sample condensing pot, electric heater, and shelves for tools.

TABLE NO. 2

	TIME		MATERIAL		TOTAL		
	Conventional	Portable	Conventional	Portable	Conventional	Portable	Apparent Saving
Absorber Dis. Gas	8-16 hrs. $12. – $24.	1-2 hrs. $1.50–$3.	$4.50	10¢	$16.50–$28.50	$1.60–$3.10	$14.90–$25.40
Vapors	10-16 hrs. $15. – $24.	2-3 hrs. $3. – $4.50	$4.00	15¢	$19.00–$28.00	$3.15–$4.65	$15.85–$23.35
Finished Product	5-6 hrs. $7.50–$9.00	3-4 hrs. $4.50–$6.00	10¢*	10¢	$ 7.60–$ 9.10	$4.60–$6.10	$3.00
Wet Gas	4-6 hrs. $6.00–$9.00	1-1.5 hrs. $1.50–$3.00	$2.25	10¢	$ 8.25–$11.25	$1.60–$3.10	$ 6.65–$ 8.15

COST COMPARISON FOR TYPICAL PLANT LOSSES SURVEY

	Conventional	Portable	Apparent Saving
Absorber Discharge Gas	$16.50–$28.50	$1.60– $3.10	$14.90–$25.40
Rectifier Vent Vapors	$19.00–$28.00	$3.15–$ 4.65	$15.85–$23.35
Finished Product	$ 7.60–$ 9.10	$4.60–$ 6.10	$ 3.00–$ 3.00
Total	$43.10–$65.60	$9.35–$13.85	$33.75–$51.75

*Dry ice may be used in conventional apparatus for this analysis.

savings accrued by the portable unit on liquid analyses are nominal and unless a large number of tests are contemplated, an operator probably would not be justified in purchasing the apparatus for these analyses alone. Costs of wet gas tests indicate that savings from approximately 40 such tests will pay for the apparatus.

Basing the payoff on complete plant surveys and assuming an average total savings of $41.50 per survey, it is found that approximately eight complete surveys will pay for the apparatus. Following these initial tests the apparatus will begin to afford direct savings in the form of lower operating costs. The figures as outlined above are rather conservative inasmuch as no consideration is given to incidental uses to which the apparatus may be put. As might be expected from the development of such a method, the portable unit has been applied to problems hitherto untouched because of excessive cost. In a generalized discussion it is impossible to cover in detail the wide range of special applications of the method, nor to emphasize its fullest possibilities.

In conclusion, the flexibility and adaptability may be illustrated best by the fact that during two years of both practical and experimental work, the apparatus has been used successfully on almost all gases and liquids found in an absorption plant where detailed knowledge of materials lighter than isobutane was not required. However, it is evident that the portable unit has limitations in its application. For instance, it would probably have little value in the control of liquefied petroleum gas manufacture. On the other hand, it affords the operator of a natural gasoline plant a rapid, accurate and practical means of process control within reasonable costs.

The author acknowledges with thanks the assistance of A. L. Bishop in the preparation of test data for this paper.

[1]Proc. Calif. Nat. Gaso. Assn., October, 1937.
[2]C.N.G.A. Bulletins TS-311 and 321.
[3]C.N.G.A. Bulletin TS-351.
[4]Ind. and Eng. Chem., Vol. 21, No. 10, p. 917 (1929)

Tide Water Associated Directorate Changes

At a meeting of the board of directors of the Tide Water Associated Oil Co. Noel Robinson tendered his resignation as vice president and director of the company to accept a position of vice president and director of the South Penn Oil Co. at Pittsburgh, Penn. The resignation was accepted with much regret.

Mr. Robinson has a service record of twenty-three years with Tide Water Associated Oil Co. In 1917 he joined Tide Water Oil Co., was elected a director of that company in 1928, and in 1929 became vice president in charge of manufacturing. Upon the merger of Tide Water Oil Co. with Tide Water Associated Oil Co. in 1936, he became vice president and director of the latter and since then has served as chairman of the operating committee of the Eastern Division of the company.

Succeeding Mr. Robinson to the Board of Directors of Tide Water Associated Oil Co., George J. Hanks was elected a director. Mr. Hanks is vice president in charge of transportation of the Eastern Division of the company, and was recently appointed vice chairman of the operating committee of that division. He has been with Tide Water Associated Oil Co. and its subsidiary companies for twenty-five years.

In 1914 he joined Tide Water Pipe Co., which was originally the parent company of Tide Water Oil Co. and which constructed the first pipe line to transport crude from the oil fields of Pennsylvania to the eastern seaboard. Mr. Hanks spent a major period of years operating from the Bradford, Pennsylvania office, but in 1933 was brought to the New York office of the company, at which time, in addition to his former duties, he assumed responsibility for the company's production in the Bradford field and took over the supervision of Tide Water Associated Oil Co.'s eastern fleet of tankers and of its Mid-Continent pipe line operations that, with the lines from the Pennsylvania fields, serve to supply the requirements of the company's refinery at Bayonne, New Jersey.

The board of directors of Tide Water Associated Oil Co. at the same meeting, declared a quarterly dividend of fifteen cents per share on the 6,368,667 shares of no par common stock outstanding, payable Mar. 1, 1940 to stockholders of record Feb. 9, 1940.

Union Oil Co. Refinery Expansion

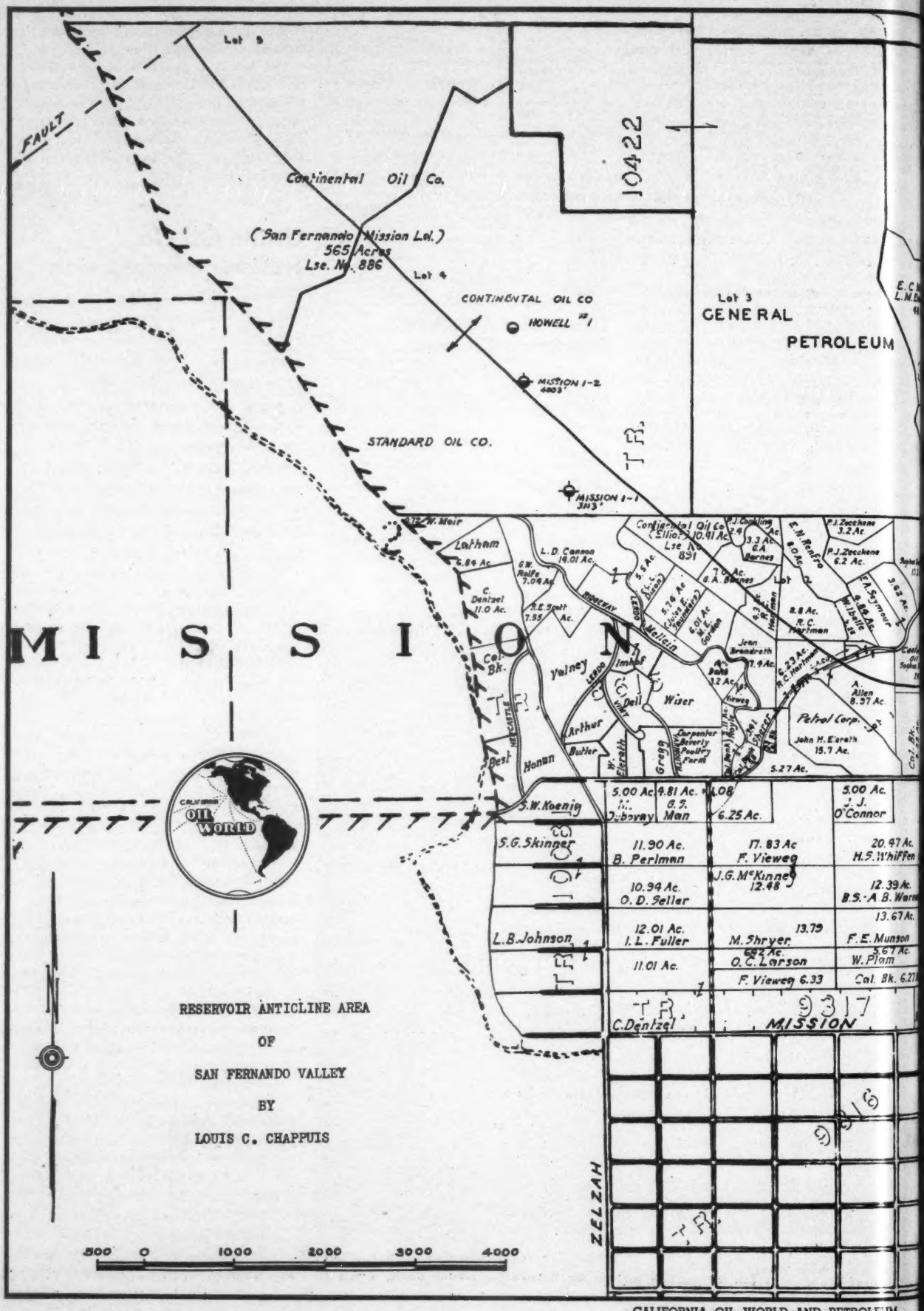
Of considerable interest in the field of refinery development for 1940, is the announcement recently made by W. L. Stewart, Jr., vice-president of the Union Oil Co., regarding the extensive building and expansion program contemplated by the company for its refinery at Oleum. Located on San Pablo Bay, near San Francisco, Oleum is noted as the location of Union's propane-solvent refining plant for the manufacture of Triton motor oil.

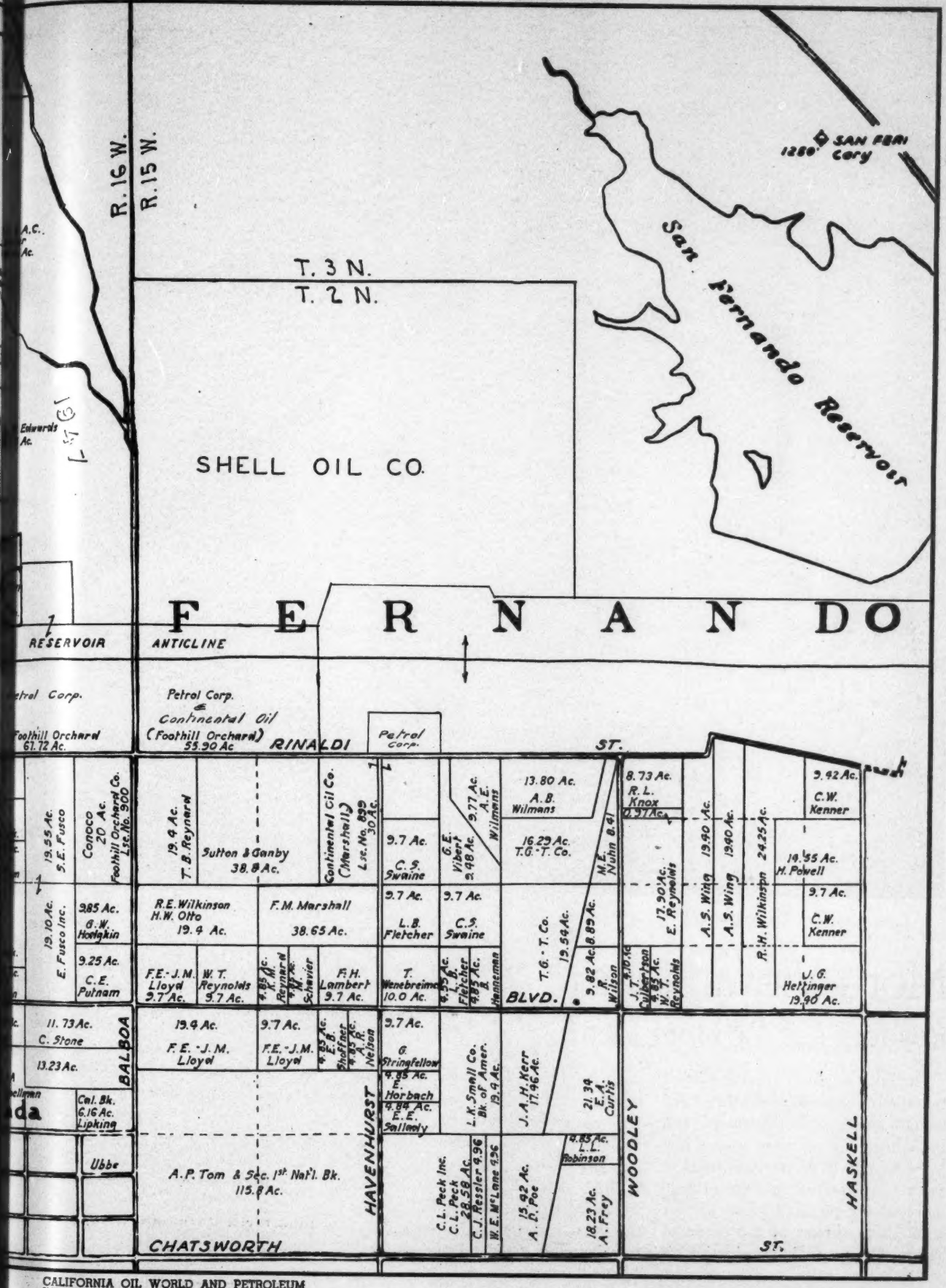
Mr. Stewart stated that at the present time new shops and change rooms for the centralization and modernization of refinery maintenance work are under construction, and it is expected that the shop buildings will be completed within the next month. This building construction is being carried on under contract by the Bechtel-McCone-Parsons Corp. of Los Angeles. Also under construction is the company's new polymerization plant which has been licensed by the Universal Oil Products Corp. The plant is being built by the Fluor Corp. and will be completed within the next four months.

In addition to the building program now under way, plans call for the construction of a new coking plant and a hydro-forming unit. The coking plant, to be one of the largest in the country, will process approximately 14,000 barrels per day of either heavy crude oil or fuel oil.

Incorporating the latest technical developments in the processing of California crude oils, Union Oil Co.'s hydro-forming unit will produce a gasoline of superior quality. This gasoline, free from gum-forming and corrosive sulphur compounds, will be utilized in the manufacture of '76' gasoline. Construction on the coking and hydro-forming units will start about June 1 and it is expected the plants will be put into operation in the early part of 1941.

You are reading the Pacific Coast oil men's home paper.


FAULT
Lot 5
Continental Oil Co.
(San Fernando Mission Lot.)
565 Acres
Lse. No. 886
Lot 4
CONTINENTAL OIL CO
HOWELL #1
MISSION 1-2
4803'
STANDARD OIL CO.
MISSION 1-1
3143'
10422
Lot 3
GENERAL
PETROLEUM
T. R.
MISSION
Latham
L. D. Cannon 14.01 Ac.
G.W. Ralfe 7.04 Ac.
C. Dentzel 11.0 Ac.
R.E. Scott 7.55 Ac.
Yalney
Wiser
Arthur
Butler
Honan
Best
Gregg
Dell
Imhof
Mellein
Petrol Corp.
John H. Eareth 15.7 Ac.
5.27 Ac.
A. Allen 8.37 Ac.
5.00 Ac. H. D. Doorey
4.81 Ac. G. S. Man
4.08
6.25 Ac.
5.00 Ac. J. J. O'Connor
S.W. Koenig
S.G. Skinner
11.90 Ac. B. Perlman
17.83 Ac. F. Vieweg
20.47 Ac. H.S. Whiffen
10.94 Ac. O. D. Seller
J.G. McKinney 12.48
12.39 Ac. B.S.-A B. Warn
L.B. Johnson
12.01 Ac. I. L. Fuller
13.79 M. Shryer
13.67 Ac. F. E. Munson
11.01 Ac.
5.67 Ac. W. Plam
O.C. Larson
F. Vieweg 6.33
Cal. Bk. 6.27
C. Dentzel
CALIFORNIA OIL WORLD
RESERVOIR ANTICLINE AREA
OF
SAN FERNANDO VALLEY
BY
LOUIS C. CHAPPUIS
500 0 1000 2000 3000 4000
ZELZAH


R. 16 W.
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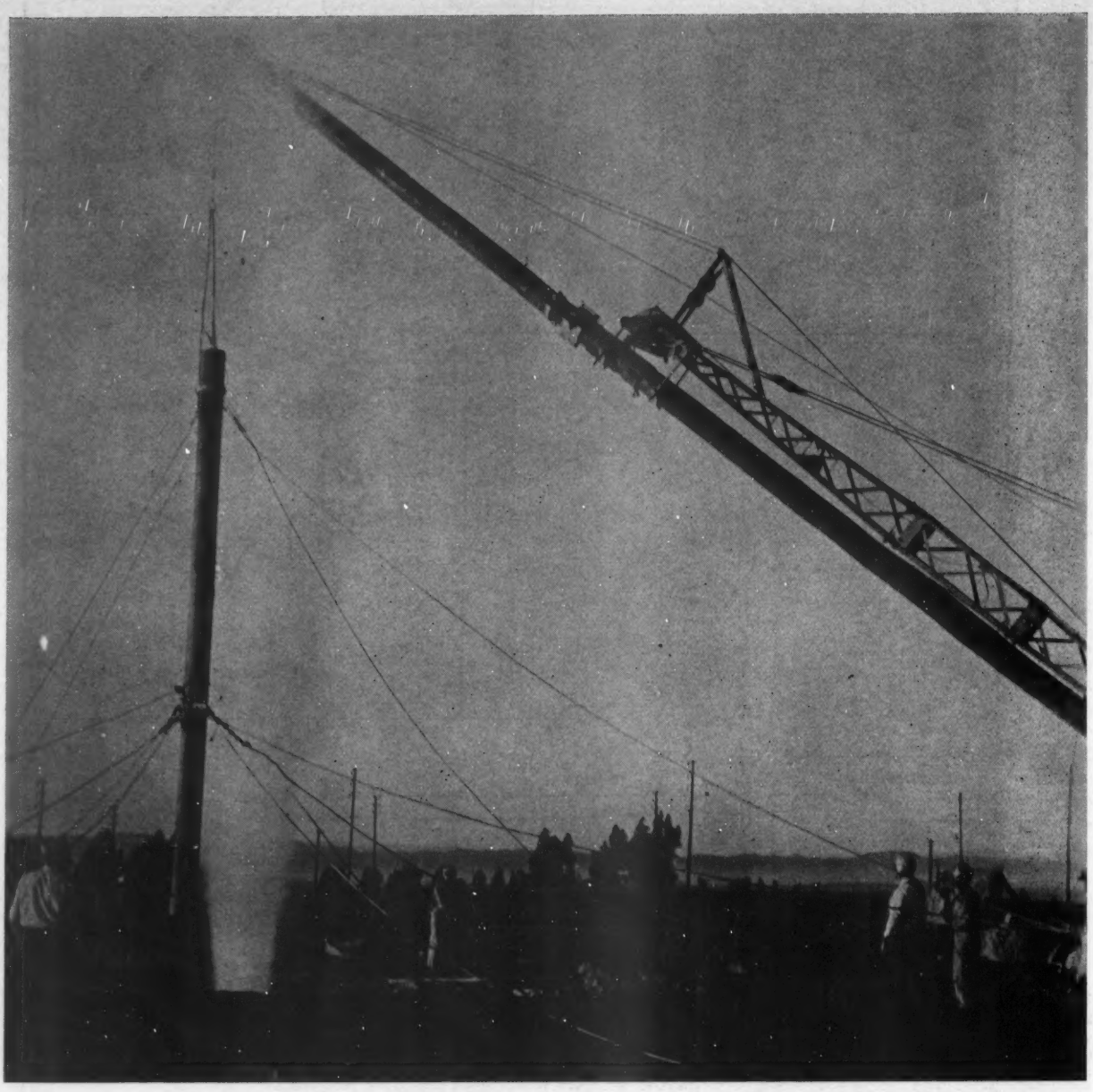
SAN FERN 1280' Cory
San Fernando Reservoir
SHELL OIL CO.
F E R N A N D O
RESERVOIR
ANTICLINE
Petrol Corp.
Petrol Corp. & Continental Oil (Foothill Orchard) 55.90 Ac.
Foothill Orchard 61.72 Ac.
RINALDI
ST.
Petrol Corp.
19.55 Ac. S.E. Fusco
Conoco 20 Ac. Foothill Orchard Co. Lse. No. 900
19.4 Ac. T.B. Reynard
Sutton & Ganby 38.8 Ac.
Continental Oil Co. (Marshall) Lse. No. 899 30 Ac.
9.7 Ac. C.S. Swaine
G.E. Vibert 9.48 Ac.
9.77 Ac. A.E. Wilmans
13.80 Ac. A.B. Wilmans
16.29 Ac. T.G.-T. Co.
N.E. Nuhn 8.41
8.73 Ac. R.L. Knox
0.97 Ac.
19.40 Ac.
19.40 Ac.
24.25 Ac.
9.42 Ac. C.W. Kenner
14.55 Ac. H. Powell
9.7 Ac. C.W. Kenner
U.G. Heltzinger 19.90 Ac.
19.10 Ac. E. Fusco Inc.
2.85 Ac. G.W. Hoelskin
9.25 Ac. C.E. Putnam
R.E. Wilkinson H.W. Otto 19.4 Ac.
F.M. Marshall 38.65 Ac.
9.7 Ac. L.B. Fletcher
9.7 Ac. C.S. Swaine
T.G.-T. Co. 19.54 Ac.
3.82 Ac. R. Wilson
17.90 Ac. E. Reynolds
F.E.-J.M. Lloyd 9.7 Ac.
W.T. Reynolds 9.7 Ac.
4.85 Ac. F.M. Reynard
4.85 Ac. W.K. Schevier
F.H. Lambert 9.7 Ac.
T. Wenebreimer 10.0 Ac.
4.85 Ac. L.B. Fletcher
4.85 Ac. E. Henneman
BLVD.
J.T. Culbertson 4.85 Ac.
W.T. Reynolds
11.73 Ac. C. Stone
13.23 Ac.
BALBOA
19.4 Ac. F.E.-J.M. Lloyd
9.7 Ac. F.E.-J.M. Lloyd
4.85 Ac. E.B. Shaffner
4.85 Ac. A.R. Nelson
9.7 Ac. G. Stringfellow
4.85 Ac. E. Horbach
4.84 Ac. E.E. Sallady
L.K. Small Co. Bk. of Amer. 19.4 Ac.
J.A.H. Kerr 17.96 Ac.
21.39 E.A. Curtis
Cal. Bk. 6.16 Ac. Lipking
Ubbe
A.P. Tom & Sec. 1st Nat'l. Bk. 115.8 Ac.
HAVENHURST
C.L. Peck Inc.
C.L. Peck 28.58 Ac.
C.J. Ressler 9.96
W.E. McLane 9.96
13.92 Ac. A.R. Poe
4.85 Ac. L. Robinson
18.23 Ac. A. Frey
WOODLEY
HASKELL
CHATSWORTH
ST.



Placing 10-in stack to facilitate work in the cellar of Ohio's Wild El Segundo gasser.

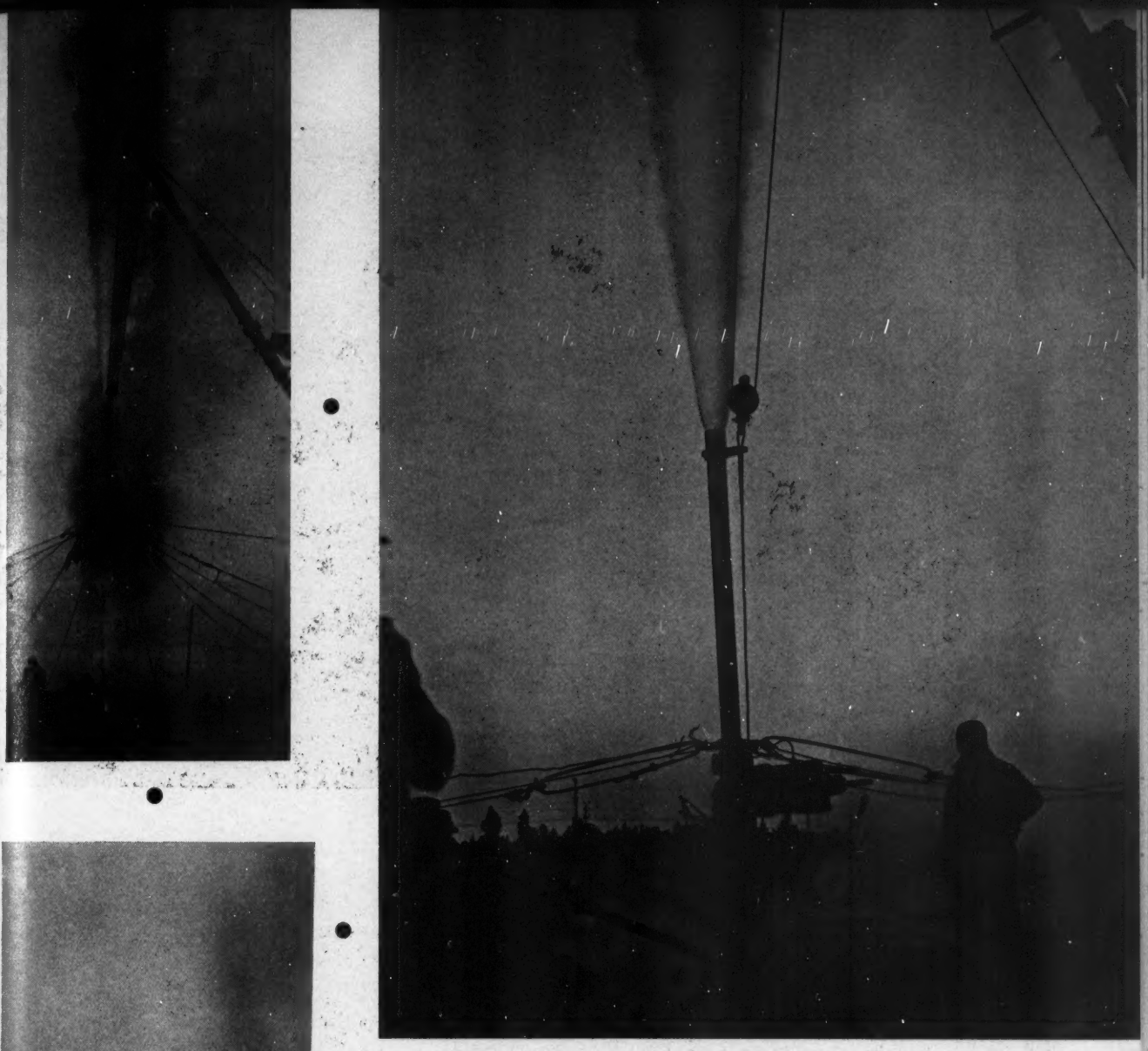
More Views, Ohio's Wild 50 Million Footer

Readers Ask for More Pictures

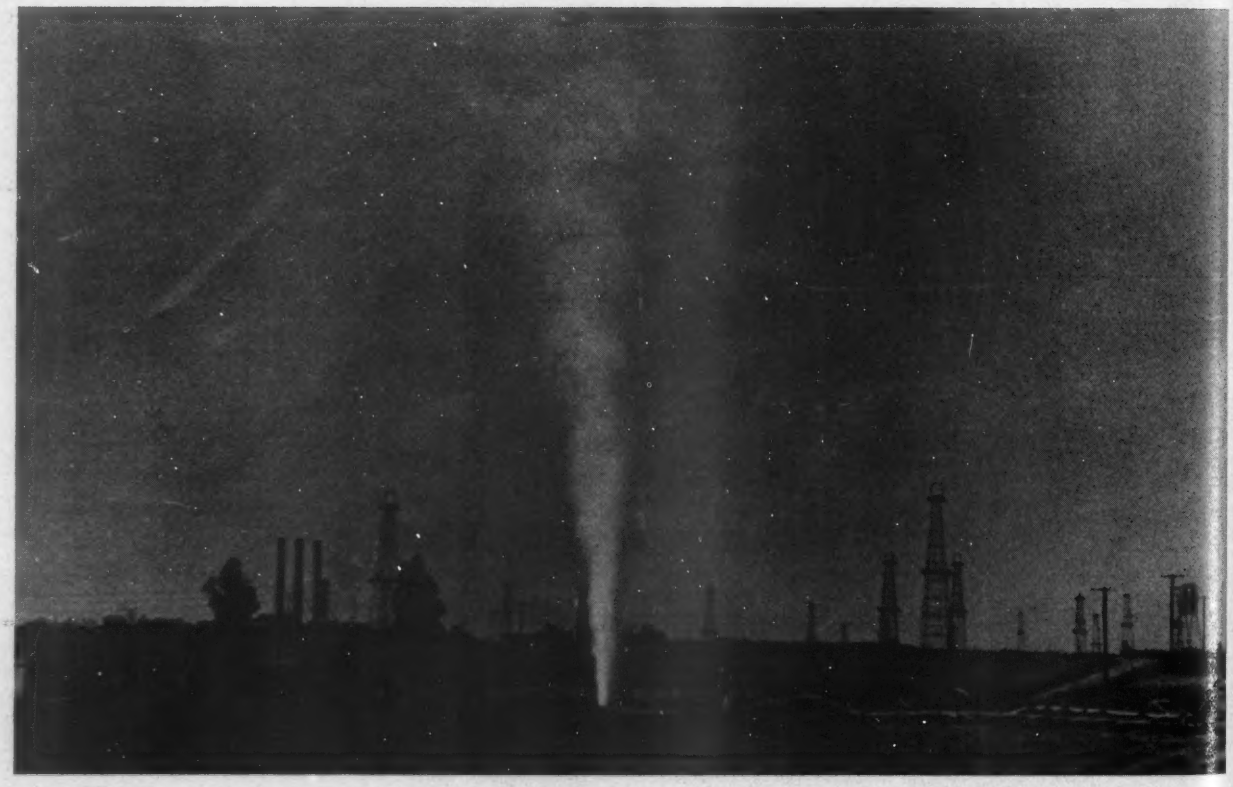
The great popular interest aroused by Ohio Oil Company's wild gasser Gough No. 12 at El Segundo, and the splendid acceptance of our last issue telling of the method used to control it, demand that we include more of the pictures taken by our staff photographer at the scene of action. By way of introduction, it must be remembered that the well mysteriously broke loose and caught fire while standing with pressure equalized at 1450 lbs. on both tubing and casing. In a very clever hook-up, gas was being brought to the surface from perforations in the 6⅝-in. water string at 3840 ft. and was being injected through tubing to repressure the oil zone at 7300 ft.

As 5000 lb. test fittings were used and as no one was near the well at the time of the blow-out, its cause may forever remain unknown. The extremely abrasive sand-laden fluid cut out the Xmas tree in only a few hours while the heat of the burning gas destroyed the steel derrick.

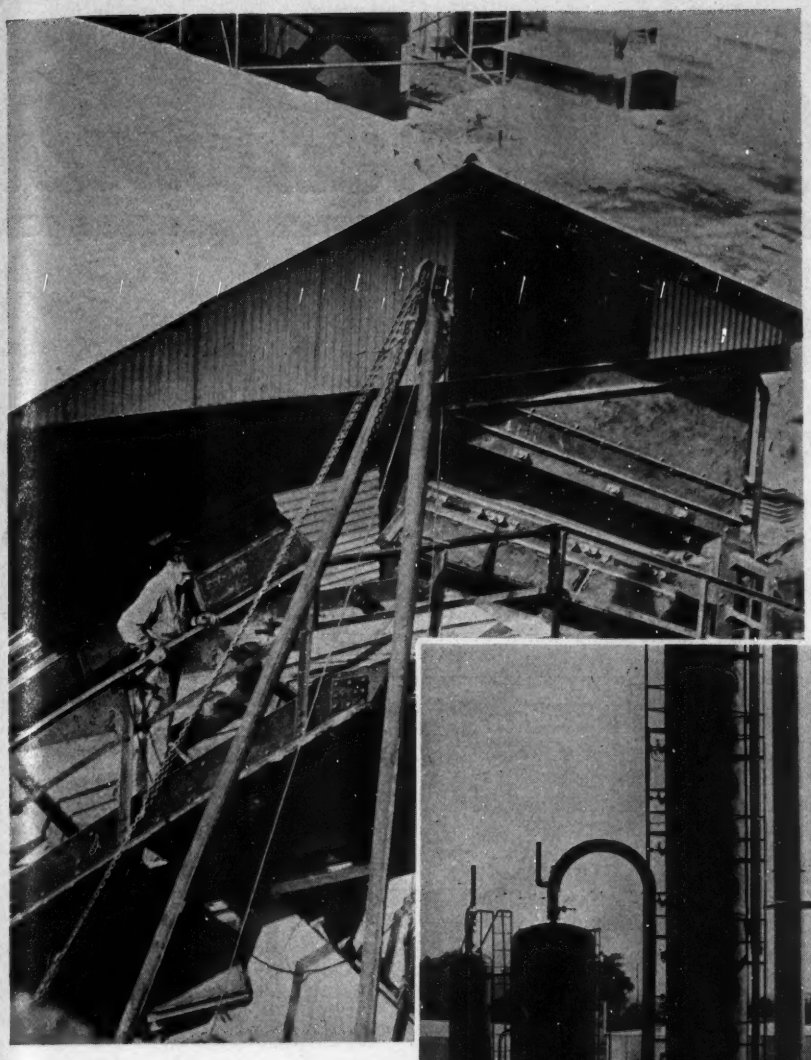
John McFadyen, Ohio vice presi-



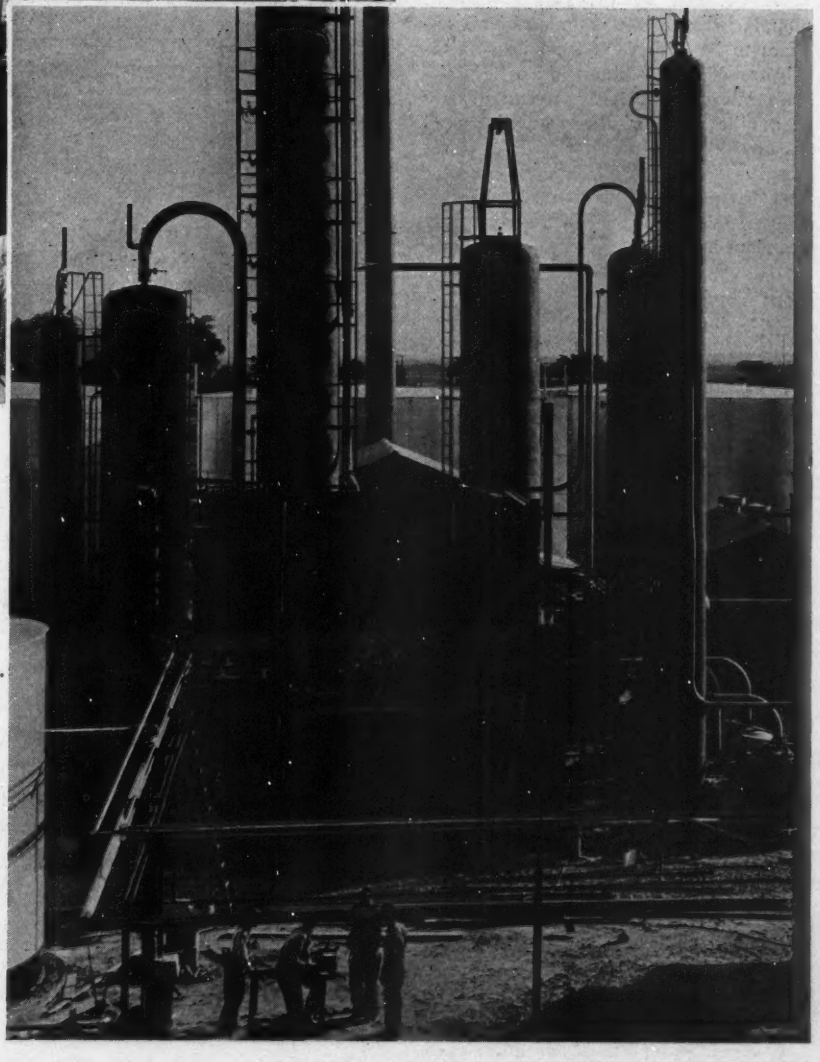
These Ohio Oil Co. and Cameron Iron Works men are working at the lip of an active volcano. When Ohio's Gough No. 12 in El Segundo's tricky high pressure gas sand went on a rampage recently, the Ohio boys worked fast to set a precedent in saving wild wells in that field.



Above: Ohio's Smith and Cameron's Bean put the finishing touches to the capping of a wild 50-million-footer. Below: "Thar she blows!"



Designers and
Fabricators of
highly advanced
refinery equipment
are kept
busy these days by
California's independent
oil men.
These "little fellows" are
spending 5 million dollars
on current refinery
projects.



dent, took personal charge of the situation and was aided by Superintendents Fred E. Smith of the San Joaquin Valley and Sam E. Furman of the Basin Division. The flame was snuffed in short order and with the debris cleared away, the services and equipment of Roy Bean, Cameron Iron Works, and Jimmy Poore of Shaffer Tool Works were accepted to aid in the actual capping operation.

Field Development

San Joaquin Valley

Whiston Outpost Try Limits Edison Pool

The oil pool located northwest of the main portion of the Edison field from which Francis O'Reilly, El Tejon O & R Co. and Petrex, Inc. have been pumping respectable amounts of oil, appears to be limited, at least in a northerly trend, by the failure of H. L. Whiston's Wasem No. 1. Located a quarter of a mile north of the presently small productive area, near the center of the southwest quarter of sec. 32,29-29, the well bottomed in coarse gray sand at 3990 ft. without showings and has been abandoned.

San Emigdio Try Drilling Ahead

Wood-Callahan is rigging up Heyden No. 1 near the northeast corner of sec. 21,30-29. The location is in the small accumulation lying a half mile southwest of the main body of the Edison field from which Wood-Callahan, Bauer Oil Co. and Kelly and Sons are at present producing.

With bottom at 13,358 ft. in shale and sand showing a few faint cuts, and similar cuts up hole the only other encouragement, Shell Oil Co.'s KCL No. 2A-52-13 is entering the extremely deep class. Located in sec. 13,11-22 on the San Emigdio plains south of the Taft-Ridge Route road, the test is a disconsolate survivor of a series of drillers from the road deep into the hills south of the current try.

Ten Section Outpost Drills Above Stevens

Already drilling below the productive tops of two immediately adjacent Stevens zone oil fields, Richfield Oil Corp.'s James Slough-KCL No. 1 presents a problem in correlation.

Located in sec. 6,31-29 two miles south of Ten Section, where the productive Stevens is found at 8000 ft., and a mile and a quarter northeast of Union Oil Co.'s Cole's Levee well, Kernco No. 52-11, which topped the Stevens near 9500 ft., the try is drilling at 9835 ft. in the hard Cherty shale which overlays this zone. Already much too low to properly find present field production, the well seems to offer little chance of saturation when the sands are encountered, although it is by no means certain that more productive sands than these may not be found.

SAN JOAQUIN VALLEY WILDCATS

Area	Well	No.	Section	Depth	Status
Fresno County					
Cantua Creek	The Texas Co., S.P.	1	23, 17-15	6969	Drilling
Coalinga	Coalinga Pacific Oil Co., S.P.A.	7	6, 21-15		Location
	Lewis, C. H.	1	18, 21-15	800	Idle
	Migs Oil Co.	8	11, 20-14	232	Drilling
Gatos Creek	Gatos Creek Oil Co.	1	19, 19-13	466	Idle
Huron	The Texas Co., Boston	1	14, 20-18	1250	Drilling
Mendota	Jergins Oil Co., Cheney Ranch	1	29, 14-13	6135	Drilling
Kern County					
Antelope	Par Petroleum Co.	1	32, 25-17	3032	Idle
Belridge—South	Union Oil Co., Fitzgerald-Weston	1	13, 29-21		Grade
Buena Vista	Gen. Pet. Corp., B.V.A.	1	1, 32-24	10973	Drilling
	Richfield Oil Corp., B.V.A.	81–36	36, 31-25	11379	Plugged 5460—Compl. Gasser
	Shell Oil Co., B.V.A.	45–9	9, 32-25	10018	Drilling
Buttonwillow	Union Oil Co., Bowerbank	4–23	23, 29-24	12144	Plugged 10,870—Testing
Devil's Den	The Texas Co., Beer	2	8, 26-19	1202	Drilling
Edison	El Tejon Oil & Ref. Corp., Douglas	2	32, 29-29	3777	Drilling
	Goodrum & Vincent, Inc., S.P.	3	31, 29-30	418	Drilling
	Mayes, A. S.	1	5, 30-29	4222	Redrilling
	O'Reilly, Francis, Edison-Land	2	5, 30-29	4103	Idle
	Whiston, H. L., Wasem	1	32, 29-29	3990	Abandoned
Kern Front	Davis Petroleum Co.	1	13, 28-27	1785	Idle
Kern River	Sleeper Ridge Oil Co.	1	15, 29-28	1797	Idle
McKittrick	Burt & Taylor, Taylor	1	30, 30-22	1047	Idle
	Calstan Pet. Co., Webber	1	34, 30-22	1220	Abandoning
	Deal, O. T., M.&M.	1	30, 30-22	6664	Idle
Panorama Hills	Burrhus, V. E.	2	31, 31-22		Rig
San Emigdio	Shell Oil Co. KCL 2A 52–13		13, 11-22	13363	Drilling
Shafter	Continental Oil Co., Comm.	1	12, 28-24	7662	Drilling
Shale Hills	Gamble & Oliver, Abbott	1	7, 27-19	2047	Idle
	The Texas Co., McD-Theta	1	12, 28-19	201	Drilling
Ten Section	Richfield Oil Corp., James-Slough KCL	1	6, 31-26	9841	Drilling
Kings County					
Kettleman—South Dome	Bristol Oil Co., Smith	1	35, 24-19	8054	Perforating
Reef Ridge	Chuka Oil Co.	2A	10, 23-16	185	Idle
W. Tulare Lake	Shell Oil Co., Cohn Estate	6–4	4, 22-19	9114	Drilling

Cantua Creek Try Drills at 7000 Ft.

The Texas Co. is still attempting to locate an oil accumulation in the Cantua Creek district of Fresno county. The present test, S. P. No. 1, now drilling a thousand feet below the top of the Temblor in sec. 23,17-15, was last reported near 7000 ft.

The project lies in a comparatively untested portion of the district some three miles southeast of Western Gulf Oil Co.'s abandoned hole, in sec. 3,17-15, which yielded a small amount of 35.8 gravity oil during tests of the Temblor in 1937. Still further southeast is one of the more discouraging trys, Shell Oil Co.'s Port Costa No. 48-30, which drilled to a barren 10,711 ft. bottom in the Cretaceous.

The continued attempts by the larger operators to locate production in this portion of the state reflects its favorable general geology.

Migs Oil Working Shallow Project

Drilling near the south quarter corner of sec. 11,20-14, as an outpost of extreme westerly Coalinga shallow production, Migs Oil Co.'s well No. 8 is reported at 232 ft. in blue shale. With no oil showings reported at this depth, final disposition of the well is reported to be under advisement.

Only other semi-active well in the area is C. H. Lewis' idle No. 1 near the west quarter corner of sec. 18,21-15, south of the field. This test apparently reached its limit at the 800 ft. mark and operations were suspended early in the year with the possibility of installing larger equipment.

Richfield Oil Corp. Completes Gas Well

Conversion of it's unsuccessful oil drilling test in the Buena Vista Lake area to an eminently successful gasser has been effected by the Richfield Oil Corp. Situated at the northerly tip of the Buena Vista gas field on a pier over the Buena Vista Lake bed in sec. 36,31-25, BVA No. 81-36 was drilled to 11,379 ft. in an unfruitful effort to find oil production in the Stevens zone.

Tests of the Tulare-Paso Robles gas sands during the drilling of the well produced large volume gas flows and saved the well from a total loss. Now shut-in, the well has yielded gas at a 15,500,000 cubic foot rate from a plugged depth of 5460 ft., the normal Buena Vista gas producing horizon.

At the southwest corner of the lake and near the uplift to Buena Vista Hills, General Petroleum Corp. continues with BVA No. 1 on sec. 1,32-24. Now coring hard brown shale near 11,000 ft. the well is considerably below the top of the Stevens zone, from which production had been sought, and is apparently taking a shot at whatever questionable sands may be encountered below the objective horizon.

At the extreme south edge of the lake, Shell Oil Co. is making new hole at 10,015 ft. after a long delay occasioned by caving hole. Most recent of the Stevens zone tests in the area, BVA No. 45-9 is conceded a chance at production due to the fact that Cherty shale, which overlays the zone, was found much higher than in the other wells, and may be on a structural high point.

Buttonwillow Test Proving to Be Dud

Results of tests up hole from bottom at 12,144 ft. in Union Oil Co.'s Bowerbank No. 4-23 near Buttonwillow are proving to parallel too exactly the results of similar tests in California Exploration Co.'s abandoned hole some four miles northwest of the current try. In each case, tests of the many fingers of sands encountered have proved them too lean and tight for production. Swabbing has produced mud with traces of oil but the fluid level has stayed near bottom with but little tendency to rise. While gas seems scarce at bottom, it is possible that tests high in the hole may yield a sufficient amount from the Pleistocene to warrant completion as a gasser. Previous drillers in the area reported reasonably good gas showings and the location of the well, in sec. 23,29-24, is on a line drawn from the Buttonwillow field to the Buena Vista field, each of which produces dry gas.

Comanche Point Wildcat Planned

A portion of the Comanche Point area lying six miles south of the Arvin field is to be prospected by Oil Scout Inc. The projected well will be known as Tejon Minerals No. 1 and will be drilled near the west quarter corner of sec. 27,32-29.

Held by many to be a particularly promising play, the area is in one of the little tested portions of the arid valley floor. Nearest development is a mile and a half northeast of the proposed driller where W. W. Stabler drilled a 3131 ft. dry hole and Comanche Point Oil Co. and Tejon Ridge Oil Co. each drilled to slightly below 2000 ft. Previous drilling has clearly delineated the ultimate depth of drilling operations in this portion of the

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Bailey Pressure Controls
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Cameron-Well Heads, Blowout Preventers, Mud Valves
Case Pumping Engines
Cardwell, Drawworks, Well Service Hoists
Chiksan Hose, Swing Joints
Crown Hydraulic Pumping Units
D & M Pistons—Rods, Liners
Edwards Wire Rope
Howard Production Crowns
Howard Pumping Units
Hughes Bits—Tool Joints
Kropp Forged Flanges, Welding Nozzles
Link-Belt Rotary Chain, Mud Screens
Manhattan Mechanical Rubber Goods Rotary Hose
Marsh Gauges
Mills Bull Plugs, Swage Nipples
Norris Sucker Rods
Perfection Thread Lubricant
Plant Packings
Ratigan Production Equipment
Raybould Couplings
Red Devil, Valves, Liners, Pump Parts
Reed Bits—Tool Joints
Republic Casing and Tubing
Republic Line Pipe
Republic Merchant's Pipe
Rex Pre-Heaters
Skinner Stuffing Boxes
Stockham Pipe Fittings
Thompson Shale Shaker
T. I. W. Rotary Slips
Titusville Boilers, Rotaries, Pumps, Engines
Tnemec Coatings
Tube Turns Welding Fittings
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U. S. Electric Motors
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district since the General Petroleum Corp.'s Mattson No. 1 in sec. 1,32-29 found the top of the schist at 8832 ft. three years ago.

Texas Co. Spuds Huron Area Try

Boston No. 1, expected to be the first deep test of the Huron area, is drilling after cementing 1200 ft. of 13⅜ in. surface casing. Located near the Fresno-Kings county line in sec. 14,20-18 by The Texas Co., the well is held to offer chances in both the Miocene and Eocene formations.

Contra Costa County Deep Try Continues

Tassajara Oil Corp. drilling E.C. Rasmussen No. 1 in the San Ramon area of Contra Costa county is drilling in Miocene formations near the 8400 ft. mark. Located in sec. 9,2s-1e, the well reports Pliocene gas showings near 1500 ft., and oil and gas showings in the interval 3150-6150 ft. which embraces the Pliocene-Miocene contact.

According to the operators, additional encouragement is expected in the Miocene and the well will be carried to the Eocene--Cretaceous contact where more oil possibilities are expected. In no case will the well stop short of 10,000 ft. unless sands too tempting to pass up are encountered. In the event deep zone production is not found it is probable that the upper showings will be tested.

Bristol Oil Gun Perfs. South Dome Veteran

Salvaged from oblivion, the old Ohio Oil Co.'s Smith No. 1, 8054 ft. abandoned hole in sec. 35,24-19, is being gun perforated above 5900 ft. by the Bristol Oil Co. Perforations are being made in showings indicated by the Strato-Graph which was run to cleaned out bottom of 5900 ft.

Bandini Petroleum Drilling Cretaceous

Drilling at the westerly edge of Coalinga Northeast production, Bandini Petroleum Co.'s well No. 46-18B was last reported in hard Cretaceous shale showing free oil in the fractures at 8950 ft. Situated one location north of the company's first well in sec. 18,19-16 the well encountered only 7 ft. of Gatchell oil sand as against approximately 36 ft. of good sand from which the first well, No. 48-18, flowed a 550 bbl. rate with 12,000,000 cubic feet of gas. Continued drilling found the oil bearing Cretaceous, the sands of which are commercially productive in only one point in California. This production is found only five miles west of the well in the shallow Coalinga-Oil City area, beyond which point the formation is found outcropped.

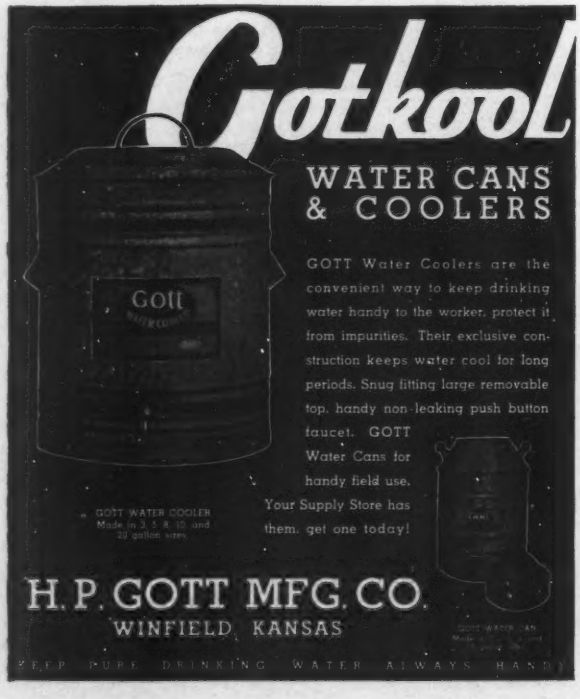
Near the center of the northwest quarter of sec. 20,19-16 Amerada Petroleum Corp.'s latest well in its discovery field, Ewing No. 22-20, was completed from 8182 ft. flowing 3065 barrel rate clean 27.5 gravity oil through a 35/64 in. bean, along with 1,200,000 cubic feet of gas.

Mt. Poso Gets New Driller

Lone activity in the Mount Poso proved area is Vanguard Oil Co.'s Baker No. 10. Located in sec. 33,27-28, where creditable production is normally found in the Vedder at the 1700-1800 ft. level, the well was last reported at 700 ft.

West Tulare Lake Test Cores Gray Sand

Coring at 9100 ft. in gray sand and shale, with no showings reported to date summarizes the drilling history of Shell Oil Co.'s Cohn Estate No. 6-4. Located at the westerly edge of Tulare Lake in sec. 4,22-19, the try is the sole deep effort and the latest driller to explore the much discussed area in several years.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Los Angeles Basin

West Montebello Completions Lag

With only two new wells on production during the last two weeks, the West Montebello boom area set its lowest completion rate in well over a year. The lull is only temporary, however, as one third of the 18 wells now listed as drilling are either making hole below 7200 ft. or are in the process of completing.

Of the two recent completions, Junior Oil Co.'s No. 1 registered the largest production. Located on the south flank of the structure, the hole was bottomed at 7610 ft. and swabbed in from 100 ft. of the Eighth zone flowing 475 bbls. a day of clean 36 gravity oil and approximately 700,000 cu. ft. of gas through a half inch bean. The company is headed by the field's youngest operator, Tom Simmons, Jr., who has just passed his twenty-second birthday.

R. R. Bush Oil Co. scored the other completion by placing Zanetti No. 2 on production at the rate of 360 bbls. a day of 37 gravity oil. Located higher structurally than the Junior No. 1, the well produces both the 8-1 and 8-2 zones. The hole is bottomed at 7675 ft. where a perforated liner is landed. Seven inch casing, cemented at 7580 ft., was gun-perforated from 7440 ft. to 7540 ft. and the well completed with a packer set at 7550 ft. and an adjustable flow bean in the tubing at 7445 ft.

Productive limits of the Eighth zones are now rather well established and no effort is being made to extend them; the future of the field lying in the possibilities of a Ninth zone. Rumor has it that a well now standing cemented at 7550 ft. will be carried down but the operator refuses to commit himself for publication.

Wells scheduled for early completion are Stag Oil Co. Brown No. 1, Westmont Oil Co. (Gus Pongratz) Brown No. 1, Shoreline Drilling Co. No. 1, Star Petroleum Co. Allen No. 1, Columbia Oil Co. Crawford No. 19 and C.A.P. Oil Co. Dutch No. 1.

Only three wells are actively preparing to drill.

Group Plans To Test Torrance Basement

Plans are being laid by a group of operators headed by Morris Berman to test the schist basement in the late hot spot area of the Torrance field. Several wells are under consideration for deepening and it is yet undecided whether to choose one in the Pennsylvania Ave. sector or carry on with one of the later wells near Eshelman Ave. In charge will be Pat McAnulty, who has drilled many wells at Torrance.

In a formation test just above the schist in its Stephens-Woodman No. 1 at the easterly tip of the field, Bren Oil Co. recovered 5½ stands of oily, gassy, mud and is considering setting casing for a production test. Total depth of the hole is 6095 ft.

South of State St. and west of Figueroa St., Vesta Petroleum Co. is drilling at a shallow level, having spudded in on the first of the month. The well is reported to be seeking a fault accumulation in the D. & B. zone.

After about a year of inactivity, Zenith Oil Co. is preparing to drill its third well at Redondo. The first two are consistent, shallow pumpers.

Chanslor-Canfield Midway Oil Co., whose exploratory work brought about the townlot campaign of 1938-1939, still is developing the Del Amo zone on its extensive leases. With Torrance No. 48 recompleted at 4903 ft. for a settled 100 bbls. a day through a 16/64 in. bean, the company moved equipment to No. 71 which is being redrilled at 3500 ft.

Sharon Abandons Imperial Wildcat

With bottom at 3118 ft. in granitics, John F. Sharon abandoned his wildcat at the west side of the Imperial Valley. No marine sediments were reported.

El Rey Drills Between Athens and Potrero Fields

Situated directly between the two highest gravity fields in the Los Angeles Basin, El Rey Oil Co. is drilling its Westmore No. 1 at the north corner of Imperial Blvd. and Western Ave. Using one of the largest butane-type rigs ever brought into California, Pettijohn Drilling Co. is reported to have made nearly 5000 ft. of hole to date.

Though many wells have been drilled in this vicinity in past years, the project is conceded better than an average

LOS ANGELES BASIN WILDCATS

Area	Well	No.	Section	Depth	Status
Athens	El Rey Oil Co., Westmore	1	2, 3-14	4052	Drilling
	Melrose Pet. Co.	1	12, 3-14		Rig
Castaic	Lang, Ed. W., Rupy	1	7, 5-16	650	Carrying casing
	Pedro Pet. Co., Jenkins	1	24, 5-17		Rig
	Worland, C. C., Jenkins-Owens	1	18, 5-16	1322	Drilling
Chatsworth	Fernando Oils, Ltd., Holmes	1	18, 2-16		Grade
Inglewood	Vanguard Oil Co., L.A.I.	1	29, 2-14		Rigged up—Idle
Mint Canyon	Redwood Oil Co., Mitchell	2	22, 4-15	525	Idle
Newhall	Canyon Oil Co., Sanborn	1	6, 3-16		Rig
	Consolidated Pet. Co., Needham	4	13, 3-16	4300	Stdg. Cem.
	Mangrum and Page, Lintz	1	4, 3-15	852	Idle
	Tamas Oil Co., Perkins	1	11, 3-16	3920	Stdg. Cem.
Palos Verdes	Rolling Hills Pet.	1	27, 4-14	6580	Idle
San Fernando	Continental Oil Co., Howell	1	2, 2-16	911	Drilling
Sunland	Casa Grande Oil Co., Lopez-Lundy	1	1, 2-15	2320	Swabbing water
Torrance	Dominguez Estate Co., Fee	1	2, 4-14	4326	Drilling
West Whittier	West Whittier Oil Co., Pellissier	1	17, 2-11	4400	Drilling
	Orange County				
Costa Mesa	Thompson, Milton N., Banning	1	9, 6-10	3735	Drilling
Olive	Jenkins, H. H.	1	17, 4-9		Location
Yorba Linda	Morgan, George, Fricke	1	21, 3-9	2132	Cleaning out
	San Diego County				
Imperial Valley	Sheran, John F.	1	3, 12s-8e	3118	Abandoned

NORTHERN COUNTIES WILDCATS

County	Well	No.	Section	Depth	Status
Contra Costa	Tassajara Oil Corp.	1	9, 2s-1e	8217	Drilling
Humboldt	The Texas Co., Holmes-Eureka	1	22, 3n-1w	4151	Drilling
Monterey	Loma Grande Oil Co., Corey	1	23, 24s-10e		Location
	Priest Valley Pet. Co., Greve	1	22, 20s-12e	2040	Idle
Sacramento	Amerada Pet. Corp., Carpenter	1	20, 4n-3e		Grade
	Superior Oil Co., Larsen	1	17, 3n-3e		Location
San Benito	Consolidated Pet. Co.	1	11, 17s-11e	2007	Abandoned
Solano	Richfield Oil Corp., Potrero Hills	2	5, 4n-1w	1300	Reaming
Sutter	Buttes Oilfields, Inc., McPherrin	6	1, 15n-1e	7075	Plugging

chance to discover a new field. The operators are being subsidized by major companies who believe in the possibilities of another Inglewood Fault accumulation.

Coyote Deep Test Pumps 250 B/D Rate

Bartholomae Oil Corp.'s Stern No. 1, the mystery well of the East Coyote field, has been completed in virgin sands pumping 250 bbls. a day of 25 gravity clean oil. Casing was cemented on bottom at 5950 ft. and several intervals were gun-perforated and tested before the final completion with the top holes at 5510 ft.

For more than a month the depth of this well was an unknown quantity, it being one of the few wells ever to be a successful "holdout."

Flowing 400 bbls. a day, Standard Oil Co. brought in Coyote No. 2-13 from two zones open from 3780 to 4075 ft. and from 4250 to bottom at 4680 ft.

Recompleting in a 25 ft. interval open to 4240 ft., Master Petroleum Co. obtained about 100 bbls. a day of wet oil. The well was formerly owned by Chiksan Oil Co.

Union Oil Co.'s Hole No. 22, located across Brea-Fullerton road from Bartholomae's new office, is pumping 100 bbls. a day of gross fluid with the cut averaging higher than 90%. The well may be deepened below present bottom of 5388 ft. where drilling was stopped when it was thought to be the same depth as the Bartholomae Stern No. 1.

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Pongratz, Seaport Dominguez Outposts

Two outpost wells are expected to go far towards outlining 7th and 8th Callender zone production in the westerly extension of Dominguez. The first, Gus Pongratz Oil Co.'s Grant No. 1, will clarify the situation northwest of the fields present most westerly producer, Russ Havenstrite's Larronde No. 1, while the second, Seaport Oil Corp.'s Long No. 1, will indicate southerly limits.

The Pongratz project, located approximately 800 ft. northeast of the intersection of Main St. and Walnut Ave., is making rapid progress below 3500 ft. and is already the center of interest for the area. Seaport Oil Corp. is planning to start work immediately at the southwest corner of Avalon Blvd. and Victoria St. Other operators, meanwhile, are marking time.

At the southeast extremity of the field, Morton & Elder bottomed Stabler-Dominguez No. 2 at 7430 ft. and are preparing for a test. The zones did not appear to be as good in this location as at the westerly extension.

Huntington Beach Activity Is Light

Activity is, at present, light in the Huntington Beach area. H.R.O. Oil Co.'s east side outpost is drilling below 3500 ft. and South Basin Oil Co. is carrying on its deep test, No. 93, at the 7000 ft. mark.

In the Five Points area, Mrs. Orr's Montgomery No. 1 is pumping a small quantity of oil and W. T. Ball is testing Harper No. 1. In the old field, Pacific American is preparing to complete well No. 6 after cementing casing at 3875 ft. and M.K.F. Oil Co. is redrilling its H.B. No. 1 at 2600 ft.

Southwest Exploration Co.'s No. 23 on the ocean front is pumping 250 bbls. of 25 gravity clean oil and the company is drilling No. 25 at 1785 ft.

Dominguez Estate Drills Below 4500 Ft.

Seeking a new field lining up with the schist producers, El Segundo and Del Rey, Dominguez Estate Co. is drilling its Fee No. 1, north of Torrance, below 4500 ft.

Apparently somewhat lower than the neighboring field to the south, the project was reported in Repetto at 4325 ft.

West Whittier Co. Prepares For Test

Hanging in the balance of forthcoming tests of Pellissier No. 1 is the future of the old West Whittier or Rideout Heights field. West Whittier Oil Co., seeking to obtain new production in the all but forgotten field, carried its well to 4405 ft. in hopes of finding a second zone, but with bottom in gray sand, has plugged and cemented casing at 3400 ft. It is planned to gun-perforate opposite the old producing horizon which was cored between 3150 and 3200 ft.

T. W. A. Completes Big Aliso Producer

Largest well yet in its private Aliso Canyon field was completed recently by Tide Water Associated Oil Co. Bottoming Porter No. 3 at 5450 ft. with 750 ft. of formation open, the company obtained its big well, initial gauges running at the rate of nearly 2500 bbls. a day. The oil's gravity is 24.5 and the water content is less than 1.0%. In common with the other wells in the field, gas production is very low, its highest rate being only 375,000 cu. ft. daily.

Tide Water's deep test, Porter No. 12, found very little encouragement to 7600 ft. and plugged back to redrill from 7250 ft. Preparations are under way to drill No. 13 and No. 22.

Highway transportation creates 7,000,000 jobs and generates $1,500,000,000 a year in taxes, a sum sufficient to pay 1,000,000 job holders salaries of $30 a week for one whole year.

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Coastal District

Hamilton Tests Goleta Wildcat

With fair promise of bringing to Goleta a repetition of the excitement of 1927, W. C. Hamilton is testing streaks of light oil sand cored from 1135 ft. to bottom at 1185 ft. Improved coring, core analysis, electrical logging and gun perforating, many oil men believe, may combine to make practical the development of an oil field here in 1940 that was considered incapable of commercial production a few years ago.

Mr. Hamilton's well is located in sec. 3-4-29, just east of the small production found by E. J. Miley 13 years ago.

Two Completing Santa Maria Wells

Two operators at present are completing wells in the Santa Maria Valley field: both in the westerly section. Operating on the O'Donnell subdivision, Fred E. Cole is bringing in Paderewski No. 3 after bottoming at 5614 ft. and cementing a water string at 5372 ft. The well should make a large producer.

On its Russell-Lollier lease north of Cole's project, Union Oil Co.'s No. 1 was finished in the Franciscan with nearly 300 ft. of the Monterey open below the casing shoe at 4335 ft. A production trial is under way. After attaining a depth of 4975 ft., Union's O'Donnell No. 2-4 twisted off drill pipe and is now engaged in a fishing job.

The wildcat well to be called Pezzoni No. 1 which was announced for the Betteravia area has not yet been started by Union, plans seemingly having been changed in order to drill LeRoy No. 4 first.

The Petrol Corp. has delayed starting its contemplated Lakeview School No. 1 in sec. 27,10-34.

Majors Finish Ventura Wells

Major oil companies shared honors in the only two recent Ventura Avenue completions.

First to go on production was Tide Water Associated Oil Co.'s McGonigle No. 16, which, with 716 ft. open to bottom at 10,100 ft., came in flowing 1136 bbls. a day of 29 gravity oil cutting 15.0%. The flow later increased to 1300 bbls. and the cut diminished to 7.5%. The 10,000 ft. zone was first opened in this sector by Lloyd Corp. in its No. 2 well last year.

Shell Oil Co. brought in No. 111 in the westerly portion of its large Taylor lease. Bottomed at 7360 ft., initial production gauged 1800 bbls. of oil and 1,300,000 cu. ft. of gas daily.

Most interesting drilling well in the field is California Alliance's northerly outpost, Hartman Ranch No. 2, which, near the 700 ft. level, will soon core for the Hisey zone.

British American Oil Producing Co. has completed its drilling program for the time being, but has tentative plans for work to start at a later date.

Trans-Oceanic 5 Cores Oil Sand

Coring oil sand and gray sand, Trans-Oceanic Oil Corp.'s M'divani No. 5 is reported to be preparing to test for production. Farthest south of the company's line of wells in the easterly fault block of the Santa Barbara Mesa field, the new well appears to be lower structurally than the last two completions, having entered the Vaqueros producing horizon at 1635 ft. Wells to the north, though at a higher surface elevation, topped the sand as high as 1535 ft.

Shiells Deep Test Finds New Oil Zone

Savage Oil Co.'s Calumet No. 8, being carried down as a deep test of the easterly section of the Shiells Canyon field, seems to have found the zone for which it sought. With bottom at 4016 ft. a formation tester was set at 3850 ft. which recovered a small quantity of oily mud and 1500 ft. of 34 gravity oil. If the completed well lives up to its preview, the Shiells Canyon field will see a lot of activity in 1940.

Mallon Builds Rig At South Mountain

Felix Mallon of Long Beach built a derrick for Richardson No. 1 near the center of the northeast quarter of sec. 14,3-21 for a westerly extension of the South Mountain field.

C. C. M. O. & G. P. Active at Rincon

Only active operators at Rincon are Chanslor-Canfield Midway Oil Co. and General Petroleum Corp. The former company has Hobson B-10A pumping an estimated 125 bbls. of fluid cutting 60.0% from a total depth of 4521 ft. and Hobson B-26 flowing 250 bbls. of clean 30 gravity oil from perforations open from 4185 to 4631 ft.

General Petroleum Corp. recompleted

COASTAL COUNTIES WILDCATS

Area	Well	No.	Section	Depth	Status
Santa Barbara County					
Betteravia	Union Oil Co., Pezzoni	1	33, 10-35		Location
Carpinteria	Sunset Oil Co.	1	32, 4-25	3413	Idle
Goleta	Hamilton, W. C., Hollister	1	3, 4-29	1184	Drilling
Lompoc	Sun-Bell Drilling Co.	1	28, 8-34	2982	Idle
Los Olivos	United Western Oil Co.	1	15, 7-30	3935	Idle
Summerland	Oil Group, Inc., Hyland	1	16, 4-26	1315	Rigging up
San Luis Obispo County					
Elk Horn	Calif. Pet. Prod., Irons	1	19, 10-24	2527	Swabbing
	Burrhus, V. E.	1	8, 32-22	60	Idle
	Burrhus, V. E., Haberkern	1	21, 32-22	1977	Drilling
Midway	Lee, H. E., Stewart	1	7, 32-22	2210	Idle
Huasna	Gilmore Oil Co., Huasna Comm.	1	11, 32-14		Grade
Paso Robles	Epco, Inc.	1	27, 26-13	6157	Idle
Ventura County					
Conejo	Sulphur Springs Oil Co., Janss	1	33, 2-19	258	Drilling
Moorpark	Shaffer, Frank, et. al.	1	30, 3-19	736	Idle
Ojai	Coronet Oil Co., Coronet	4	17, 4-21	1165	Idle
Santa Susana	K. C. Oil Co., Marr	1	32, 3-17	1014	Idle
Sespe	Brain, Phillip, Cosby	1	14, 4-19	1120	Idle
	G. E. Development Co.	7	13, 4-19	150	Drilling
	Hall, Henry Lynn, Tar Creek	1	35, 5-19	1275	Idle
	Renard Oil Co.	1	6, 4-19	1100	Idle
Shiells Canyon	Galveston Oil Co.	1	5, 3-19	3140	Idle
Simi	Levesque, G. M., Robertson	1	17, 2-18	2250	Repairing Rig
	Ohio Oil Co., Vail	1	10, 2-19	995	Drilling
South Mountain	Albatross Oil Co., Schiefferle	1	17, 3-20		Rig
	Mallon, Felix, Richardson	1	14, 3-21		Rig
	Rilling, Harry	1	13, 3-21	3127	Pumping

Tomson No. 4 at the plugged depth of 3215 ft. pumping 80 bbls. of clean oil and is running a liner to finish Tomson No. 2 at 3774 ft. The company's Hobson No. A-3 will be recompleted in the 3950 ft. zone.

Gilmore Delays Huasna Wildcat

Because of title difficulties and unfavorable weather, Gilmore Oil Co. has delayed starting its projected test of the Huasna area of San Luis Obispo county. The well will eventually be drilled in sec. 11,32-14.

Ohio Spuds Simi Test

Ohio Oil Co., seeking a new field in the Simi Valley, has spudded its Vail No. 1 in sec. 10,2-19. The well is regarded as the most important try for new production in Ventura county for some time and will be watched closely by other operators holding properties in the region. Spudded on the 29th of January, progress has been slow due to bad weather and the hole is down only a little more than 1000 ft.

Sulphur Springs Spuds Janss No. 1 at Conejo

Sulphur Springs Oil Co., a Los Angeles concern, has spudded in its Janss No. 1, located in sec. 33,2-19 in the Conejo area of Ventura county. With the drill starting in Middle Miocene Topanga formation, only about 500 ft. of hole has so far been made.

Gallonage Record Reached in 1939

California motorists burned almost 5,000,000 gallons of gasoline every day during the year, 1939, to set a new record for the use of motor vehicle fuel, the State Board of Equalization reports.

The actual consumption of gasoline for the 12-month period amounted to 1,810,768,366 gallons, or 4,961,009 gallons each day, board records revealed.

"This represents a gain of 5.27 per cent over the previous year which, up to the time of the present report, was the highest in the history of the state," said Fred E. Stewart, Oakland board member. "I believe this is indicative of improved economic conditions throughout California."

The tax for last year amounted to a total of $54,323,050.98, levied on the basis of 3 cents per taxable gallon and used for highway purposes throughout the state. The 1938 income from the source amounted to $51,601,430.04, or $2,721,620.94 less than for 1939.

Income from December sales of gasoline, according to board records, amounted to $4,551,246.09 as compared with $4,376,490.24 for the same month of the previous year, a gain of 3.99 per cent. The December total was slightly under that of $4,628,322.90 recorded for November, 1939.

Oil companies reporting sales of more than 300,000 gallons in December were listed by the Board with the explanation that resale of gasoline previously taxed and exempt sales to the Federal government or in interstate or foreign commerce accounted for differences between total sales and taxable sales. These companies were as follows:

NAME	Gallons Actually Sold	Net Taxable Gallonage
Aromalene, Inc.	438,718	438,718
Atlas Refining Company	508,536	508,536
Bankline Oil Company	489,335	None
Belridge Oil Company	2,135,185	335,107
Brown, Henry, dba. Operators Oil & Ref.	718,024	718,162
California Oil & Ref. Co.	380,518	380,518
Caminol Company, Ltd., The	3,679,869	3,118,488
Century Oil Company	957,180	652,503
Chanslor-Canfield Midway Oil Co.	525,137	None
Coline Gasoline Corporation	1,109,426	2,208
Cowan Oil and Refining Co.	1,189,192	None
Del Rey Oil & Gas Company	534,247	5,580
Eagle Oil & Refining Co., Inc.	4,001,977	2,963,537
East West Refining Co.	1,207,296	1,207,296
El Camino Refining Co.	768,907	768,907
Elm Oil Company	393,102	393,102
El Tejon Oil & Refining Corporation	1,008,569	986,295
Envoy Petroleum Co.	807,708	807,708
Estado Petroleum Corporation	2,194,654	2,194,081
Exeter Refining Company	860,583	855,270
F. R. Long, Inc.	471,389	None
General Petroleum Corporation of Calif.	34,821,917	8,182,003
Gilmore-Dabney, Inc.	430,892	None
Gilmore Oil Company	6,210,162	27,025
Hancock Oil Company of Calif., The	4,194,772	2,143,110
Harbor Refining Company	521,339	521,339
Honolulu Oil Corporation	724,596	6,013
Kern Oil Company, Ltd.	1,079,878	1,079,679
Krieger Oil Company	683,379	675,334
Lomita Gasoline Company	1,401,206	None
Los Nietos Producing & Refining Co., Ltd.	2,395,686	903,210
Macmillan Petroleum Corporation	2,438,097	2,397,090
Mangold & Tweedy Refining Co.	305,151	305,151
McCallen Refining Company	811,892	811,892
Meek, Herbert A. ,dba. Henry H. Cross Company of Calif.	343,055	None
Mercury Petroleum Corporation	470,283	470,283
Moffett, J. O., dba. San Fernando Refining Company	377,496	377,492
Mohawk Petroleum Corporation	3,919,422	3,178,306
Natural Gasoline Company	431,923	350
Norwalk Company, The	1,431,972	1,285,971
O. C. Field Gasoline Corporation	2,234,600	118,153
O. F. Collinge, Inc.	528,709	None
Olympic Refining Company	1,153,523	1,113,292
Pacific States Oil Co.	1,806,759	1,645,787
Pacific Western Oil Corporation	472,688	1,014
Pan Pacific Oil Company	301,808	301,808
Pan-Southern Oil Co.	301,840	None
Pathfinder Petroleum Company	578,398	561,223
Petrolane, Ltd.	524,818	296,883
Petrol Corporation, The	2,042,796	1,029,115
Richfield Oil Corporation	16,933,288	14,456,247
Rio Grande Oil, Inc.	3,105,378	None
Roath, Marshall, dba. Cascade Oil & Ref.	2,047,782	2,028,544
Rothschild Oil Company	851,740	851,740
R. R. Bush Oil Company	1,049,448	1,045,736
Seaboard Oil Company of Delaware	1,085,908	None
Seaside Oil Company	3,481,612	1,356,439
Shell Oil Company, Inc.	22,562,246	16,501,428
Signal Hill Refining Company	788,888	788,888
Signal Oil & Gas Company	1,385,985	None
Signal Oil Company	5,422,276	None
Socal Oil & Refining Company	985,100	773,393
Standard Oil Company of California	55,125,755	23,555,972
Sunset Oil Company	3,169,669	None
Superior Oil Company	3,220,885	656,183
Texas Company, The	11,491,119	7,181,959
Tide Water Associated Oil Co.	25,778,610	11,895,678
Tiernan, P. S., dba. Tiernan Ref. Co.	509,631	509,631
Union Oil Company of California	22,559,853	15,865,403
Triangle Oil & Refining Co.	617,798	616,178
West Coast Refining Company	400,009	None
Western States Gasoline Corporation	2,711,959	102,613
Wilmington Gasoline Company	313,260	11,588
Wilshire Oil Company, Inc.	8,422,381	8,183,506

Byron Jackson Co. Wins Patent Suit

Byron Jackson Co. has won an important patent case in a decision rendered by Judge Colin Neblett of the United States District Court at Santa Fe, N. M. This company manufactures the well-known BJ Oil Well Tongs and brought suit in the federal court in New Mexico against Malcolm E. Self and the Harry Bass Drilling Co. of Hobbs,, New Mexico, for infringement of five patents held by it covering its tongs. It was charged that these patents were infringed because the defendants were engaged in the practice of adding to the plaintiff's patented tongs an additional jaw which adapted them for use on sizes of pipe for which they were not manufactured. In his decision, rendered Dec. 5, 1939, Judge Neblett has ruled that this practice is an infringement of Byron Jackson Co. patents and has awarded an injunction restraining the defendants from engaging further in the practice. In rendering the decision, the Court indicated that Byron Jackson Co. was within its patent rights in determining for what particular sizes of pipe its tongs should be designed and that others could not interfere without violating the patents.

Morgan Threatens Yorba Linda Boom

A recurrence of the Yorba Linda boom of two years ago is threatened by the action of Geo. Morgan's Fricke No. 1. Bottomed at 2132 ft. and with the hole open below the 5½ in. shoe at 2000 ft., the well flowed through a formation tester at a rate estimated at 60 bbls. a day. Testing 19.5 gravity and cutting 10.0%, the oil flowed through a 16/64 in. orifice.

The project is located just south of the Shell Oil Co.'s sensational core hole which was the sparkplug of the last Yorba Linda drilling flurry.

With the advent of pre-packed liners and oil well heaters in the last few months, it may be possible to lick the physical conditions which heretofore have prevented the wells from yielding commercially. Already several independent operators have signified their intention of reentering the field.

Unbroken safety records for four employes of an oil producing company add up to 84 years.

The average motorist in the United States must work two whole weeks each year to pay the taxes on his car.

LAUGH THIS OFF

There are two periods in the life of an oil man according to **Andy Hazard** when he becomes extremely dissatisfied with his lot—**before** he enters the oil business, and **after** he enters the oil business.

And all the absent-minded individuals are not college professors as witness this episode which occurred at Santa Fe Springs recently. Coming down the steps from a loft in the warehouse with a load of hardware, a stock clerk missed his footing and fell to the bottom, creating a ferocious clatter as he scattered his jangling collection. Jumping to his feet he cupped his ear, and in a startled voice exclaimed, "What the heck was all that noise?"

The doctor had the stetoscope on **Phil Rockfellow's** chest and was listening very intently when Juckie, the Rockfellow heir apparent, inquired, "What station is he trying to get?"

On this subject **Nate Mull** suggests a cure for the radiomanic. The idea is this: He shuts off his set at 2 a.m., and you call him up at 4 a.m. to tell him how much you liked it.

And **Harry Hensell** reports that the guy who invented a loud speaker that can be heard a mile away is still in the hospital.

Whereupon we listen in to **Henry Scanlon** as he expounds the fact that airplanes are held in the air by suction, and that horses are also supported by suckers.

And have you ever noticed that in a town where you can park as long as you want to, there is no reason why you should want to?

Doug Barnes notes that scientists have discovered an insect in South America which carries a white light in front and a red one behind, but Doug still believes it is nothing but an Austin with the wanderlust.

Now veering off on another track, says the pumper to his boss, "Say, boss, I'd like to have a raise. I just got married." Replies the boss, callously, "Sorry, son, we're not responsible for off-duty accidents."

And **Harrison Lawler** tells about the timid lad who broached his chief with this story: "My wife says I have to ask for an increase." To this the big boy answered, "Okay, I'll ask my wife if I can give it to you."

You know of course that an increase is merely a small incriment which is added to your check just before you plunge deeper into debt.

Harrison, by the way, is pretty tickled over the fact that he has almost finished **"Gone With the Wind"**. He only has a few pages to read in the middle.

At this point we pause to announce that a local absent-minded professor has actually discovered what makes an absent-minded professor absent minded, but unfortunately he can't remember the answer.

And **Elsie Miller** takes the floor to remark that while a married man always has a better half, a bachelor usually has better quarters.

A bachelor, of course, usually being a guy who never makes the same mistake once.

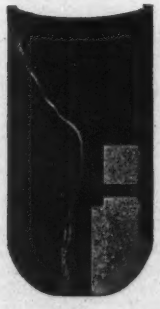
In other words, the husband of a spinster.

A financial expert in a local paper says the oil business is definitely "warming up." Considering where it has been, we should think it would be more correct to describe the change as "cooling off."

With which few remarks we again conclude. Remember that while faith will move mountains, it doesn't seem to have much effect on furniture.

And the best way to dispose of cast off clothing is to hang them up and go to bed.

BAKER GIVES YOU EASY DRILLABILITY.



ONLY COMPLETELY DRILLABLE MATERIALS ARE USED IN THE INTERNAL CONSTRUCTION OF BAKER FLOATING UNITS.

Calvin N. Payne Appointed American Meter K. C. Head

American Meter Co. announces the appointment of Calvin N. Payne as manager of its Kansas City office, succeeding the late Eugene Metz.

Mr. Payne's recent promotion comes after association with this company for the past eighteen years. After ten years of production, service and sales experience at the Metric Metal Works plant, Erie, Pa., he was placed in charge of the Denver, Colo., office of American Meter Co. in 1930.

He will now assume the responsibility for serving this company's customers located in Missouri, Kansas, Nebraska, as well as in Colorado, and in adjacent areas of Utah, Wyoming and Montana.

Mr. Payne is a graduate of the Hill School, Pottstown, Pa., in the class of 1918. After graduation from the Hill School, he enlisted as a seaman with the U. S. Navy during 1918, and attended Princeton University in the class of 1922.

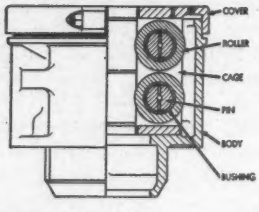
He is a member of the American Gas Association, the Midwest Gas Association and the Missouri Utilities Association.

Improved Kelly Bushing Announced by Baash-Ross

A fundamentally improved, heavy duty, roller kelly drive bushing, designated the 2RS Roller Kelly Drive Bushing, is now available from the Baash-Ross Tool Co. This newly developed roller kelly drive bushing features unusually heavy construction throughout, and has been designed especially for the heavy torque loads and high rotation speeds of modern deep well drilling. Each of the driving surfaces of the kelly is contacted by two extra-large diameter rollers and by no other part of the drive bushing. These rollers provide adequate contact area with the driving surfaces of the kelly, reduce frictional resistance to feeding, and prevent tearing or corrugating the kelly faces.

Torque loads are transmitted directly through each of the highly hardened driving rollers to a replaceable inner roller bushing which absorbs virtually all of the wear that occurs. The roller bushings in turn ride upon large diameter reversible roller pins which are case hardened and ground to minimize wear. When one side of the roller pins becomes worn, the pins can be reversed so that virtually double pin life is assured.

The advantage to this type of drive bushing, according to the manufacturer, is that the roller action causes the kelly to feed through the rotary easily, allowing a more sensitive feed control, more accurate weight indications, and freedom from binding. Also, the inner



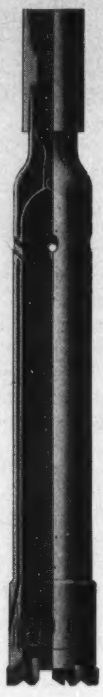
bushings and reversible roller pins provided in the design confines wear to the cheapest part of the roller kelly drive bushing.

Further information about the Baash-Ross Type 2RS Roller Kelly Drive Bushing is now available in bulletin form from the Baash-Ross Tool Co., 5512 Boyle Avenue, Los Angeles, Calif.

S. R. Bowen Co. New Junk Basket

A new type Junk Basket for quickly and easily recovering small steel objects lost in the hole has recently been introduced by S. R. Bowen Co., Santa Fe Springs, Calif. The tool incorporates a unique principle of fluid circulation which provides inward fluid flow for washing the fish into, rather than away from, the center of the basket body. It is the only junk basket manufactured which permits full pump pressure to be applied.

The Bowen Junk Basket consists essentially of a top sub, a combination inner and outer barrel having fluid ports, a ball valve, a junk catcher and a standard mill type shoe. As the Basket is run in the hole, full circulation is maintained through the center of the tool as well as side passages, thus keeping the barrel clean and free from heavy mud. Then by simply dropping a steel ball down the pipe, the entire fluid flow is diverted through the side passages of the barrel. This forces fluid to flow outwardly and downwardly against the circumference of the hole, where it is deflected from the sides in such a manner that all loose objects are washed to the center. The fluid stream, flowing to the center of the tool and up through it to return ports, creates a reverse circulating action so that, by opening the pumps to full capacity and rotating the tool on bottom,



all material is forced into the center of the barrel where it is trapped and held by the core catcher. The mill quickly cuts a short core in the formation, further aiding in guiding the junk into the Basket.

The Bowen Junk Basket can be obtained in a wide range of sizes for all holes up to 17 inches in diameter. Various assemblies are available for use on bottom of the tool.

For full particulars, write direct to S. R. Bowen Co., Santa Fe Springs, California.

El Tejon Plans Dubbs Installations

In order to increase gasoline production to meet the requirements of its growing business, El Tejon Oil & Refining Co. of Bakersfield, Calif., has asked Universal Oil Products Co. to send engineers to survey the El Tejon refinery and make recommendations to bring its operations into line with Dubbs principles and the latest Dubbs improvements.

This was stated by Gould Fitch, president of El Tejon, who announced at the same time the signing of a license agreement with Universal. Universal engineers are already on the job.

At present the El Tejon refinery is running 2,500 to 3,000 barrels a day of crude from fields in the Bakersfield area, and is operating a viscosity-breaking unit which produces 22 to 25% of cracked gasoline. The other products are Diesel oil, tractor distillate and heavy fuel oil.

You are reading the Pacific Coast oil men's home paper.

Dewey Barber, left, and Herbert Acason, of the Production Equipment Co. In the background is a Buda Natural Gas Power Unit.

Production Equipment Co. Announces Buda Expansion

Dewey Barber, president of the Production Equipment Co., Los Angeles, has announced a considerable expansion of their Buda engine sales activities and that Herbert Acason, well known in the engine business, will be in charge of Buda automotive and industrial engine sales. Barber's firm has been distributor for Buda Diesel, gasoline, butane and natural gas engines in the petroleum fields for the past six years, in the California territory south of Fresno and the state of Arizona. During that time well over one thousand Buda engines have been installed for oil field service.

According to Barber "the expansion of our sales activities into the automotive and industrial fields is the result of the splendid success with which Buda engines have performed their work in grueling oil field operations. Mr. Acason's wide sales and engineering experience, and intimate knowledge of both automotive and industrial engine practice, will be of tremendous value to our host of customer-friends. The new six cylinder Buda Diesel for Ford and Chevrolet truck replacement has already brought a host of inquiries which Herb Acason is personally handling."

Mr. Acason is well remembered in the mid-west for his pioneering work with Cummins Diesel engines. For a number of years Mr. Acason was a distributor for Cummins with headquarters in Denver. Many of the first automotive Diesels sold in that area were introduced by Mr. Acason, who also was active in the sale of industrial and municipal generating plants. Two years ago he came to Southern California where he continued his activity in the Diesel field.

At the Production Equipment Co.'s showrooms, at 651 East Gage Street, a complete line of Buda Diesel, natural gas and butane engines for industrial, oil field and automotive services are now on display. These engines range from small four cylinder units of 173 cubic inch displacement to large six cylinder engines of 1879 inches displacement. An important design feature of all Buda gasoline engines and the large Buda Diesels is that they may be converted to burn butane or natural gas at extremely small cost and within a minimum of time. Complete stocks of replacement parts have been maintained at the same address for some while, with twenty-four hour service available on any type Buda engine in this territory.

It is Mr. Acason's plan to immediately enlarge the sales program by appointing a number of key-dealers throughout the territory for both automotive and industrial engine sales and servicing.

E. B. Badger & Sons Appoints Coast Manager

E. B. Badger & Sons Co., Boston, Mass., Chemical and Petroleum Engineers, announces the appointment of A. J. Broggini as manager of its Pacific Coast Division with offices at 111 Sutter St., San Francisco. Mr. Broggini is a graduate of the University of Michigan in Chemical Engineering. Prior to joining the Badger sales engineering staff, he was with Industrial Rayon Corp., Sun Oil Co., and Edeleanu Co., Ltd. Much of his experience with the Badger organization, which he joined several years ago, has been in connection with solvent refining, dewaxing, and the Houdry Process. He has spent some time in other countries in connection with the design, construction and operation of Badger-designed units, perhaps the most notable one being the large Edeleanu plant recently completed at Aruba, Dutch West Indies.

A. J. Broggini

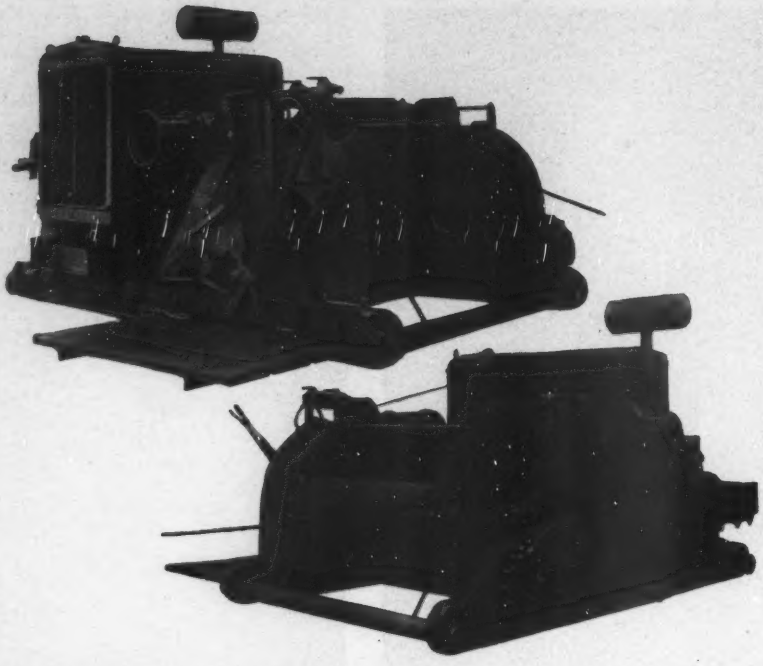
A.P.I. Tanker, Marketing-Waste Groups Appoint

P. C. Lamb, Richfield Oil Corp., Los Angeles, has been appointed to the American Petroleum Institute's Central Committee on Tanker and Barge Transportation, and George C. Gabler, Shell Oil Co., Inc., St. Louis, has been appointed to the Institute's Division of Marketing committee on the disposal of marketing wastes, it was announced by D. V. Stroop, secretary of the division. Mr. Lamb succeeds A. M. Kelley and Mr. Gabler replaces K. A. Miller.

Williams & Kilsby Named Pittsburgh Crucible Agents

The Pittsburgh Crucible Steel Co., Pittsburgh, Pa., with mills at Midland, Pa., announces the appointment of Williams & Kilsby as exclusive Pacific Coast representatives for the sale of its products in the States of California, Oregon and Washington. Williams & Kilsby have offices in the Standard Oil Building, Los Angeles, Calif.

Of each $1 paid for gasoline at service stations, only 71 cents actually goes for motor fuel. The other 29 cents is taken by the tax collector. This amounts to a 40-per-cent sales tax levy.



Cardwell Adds New Draw Works

Cardwell Manufacturing Co., Wichita, Kansas, announces a new addition to its line, a Model L slim hole or workover draw works developed especially for slim-hole drilling and workover jobs. This new, light-weight draw works, driving from a hydraulic transmission through a "Cardwell speed drive," operates just like a steam rig. The entire range of engine power is constantly available at maximum speed without shifting gears.

The hydraulic transmission sprocket drives to an auxiliary shaft on which three "Cardwell" built friction clutches are mounted. The "Hi-Lo" drive, consisting of two of these clutches with sprockets driving to the countershaft, makes it possible to instantly double the line speed. The third friction clutch operates the rotary table drive and is supplied with clutch brake for stopping the table.

Air controls operate the two "Hi-Lo" friction clutches, rotary table drive friction clutch and the countershaft brake.

Either brake of the new, dual, fully equalized, single adjustment brakes will automatically hold the full capacity load should the other brake fail.

Model L draw works is for rotary drilling to 4500 feet with 3½-inch drill pipe or to 3500 feet with 4½-inch drill pipe and for workover jobs to 8000 feet, using 2½-inch tubing.

A.P.I. Public Relations Increases Membership

Membership of the Subcommittee on Personnel of the American Petroleum Institute's Central Committee on Public Relations has been increased to 18 with the appointment of 10 new members by W. S. S. Rodgers, The Texas Co., New York, chairman of the central committee.

Newly-appointed members of the committee, of which H. H. Anderson, Shell Oil Co., Inc., St. Louis, is chairman, are: Paul G. Blazer, Ashland Refining Co., Ashland, Ky.; O. R. Burden, Texas Pipe Line Co., Wichita Falls, Tex.; W. P. Edmunds, The Standard Oil Co. (Ohio), Cleveland; **A. C. Galbraith, Union Oil Co. of California, Los Angeles;** R. C. Jopling, Phillips Petroleum Co., Bartlesville, Okla.; W. H. Meier, The Atlantic Refining Co., Dallas; M. J. Norrell, Magnolia Petroleum Co., Dallas; Einer Rygg, Gulf Oil Corp., Pittsburgh; Warren Spies, Cities Service Oil Co., Chicago; and J. S. Stubbs, The Pure Oil Co., Chicago.

Members reappointed for 1940 are: Paul V. Barrett, The Ohio Oil Co., Findlay, Ohio; Seth W. Candee, Tide Water Associated Oil Co., New York; C. R. Dooley, Socony-Vacuum Oil Co., Inc., New York; H. W. Jones, The Atlantic Refining Co., Philadelphia; Frank W. Pierce, Standard Oil Co. (New Jersey), New York; C. O. Strahley, The Texas Co., New York; and J. L. Sweetin, Shell Oil Co., Inc., New York;S. R. Bumann, American Petroleum Institute, is secretary.

Mud hogs—pumps circulating muddy fluid through drill stem to prevent walls from sloughing.

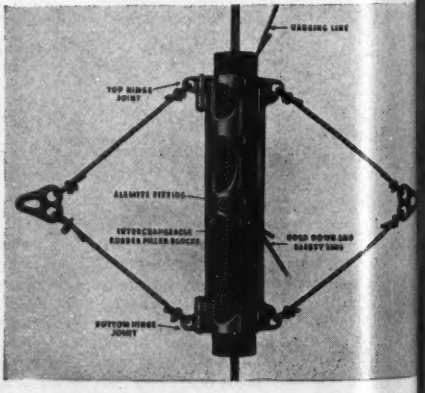
A.P.I. Refinery Group Appointments Announced

The 1940 program committee of the American Petroleum Institute's Division of Refining, with G. G. Oberfell, Phillips Petroleum Corp., Bartlesville, Okla., as chairman, has been appointed by J. Howard Pew, chairman of the General Committee, it was announced recently by R. P. Anderson, secretary.

Members include: H. W. Camp, Cities Service Oil Co., Tulsa, Okla.; **F. S. Clulow, Shell Oil Co., Inc., San Francisco;** T. G. Delbridge, The Atlantic Refining Co., Philadelphia; **E. W. Gard, Union Oil Co. of California, Los Angeles; R. A. Halloran, Standard Oil Co. of California, San Francisco;** J. Bennett Hill, Sun Oil Co., Marcus Hook, Pa.; E. W. Isom, Sinclair Refining Co., New York; N. E. Loomis, Standard Oil Development Co., New York; K. G. Mackenzie, The Texas Co., New York; Walter Miller, Continental Oil Co., Ponca City, Okla.; J. B. Rather, Socony-Vacuum Oil Co., Inc., New York; J. K. Roberts, Standard Oil Co. (Indiana), Chicago; Herschel G. Smith, Gulf Oil Corp., Philadelphia; and C. R. Wagner, The Pure Oil Co., Chicago. R. P. Anderson, American Petroleum Institute, is secretary.

Patterson-Ballagh Improved Wire Line Guide

In order to expedite the replacement of rubber sleeves when the latter finally become too worn for efficient service, Patterson-Ballagh has developed a hinged type, 4-section wire line guide. The two halves of the metal housing are held together by top and bottom hinge joints and clamped with lock nuts on the opposite side for quick removal of the rubber cylinder. This improvement is said to be available only in the 4-section Patterson-Ballagh Wire Line Guide. A hanging line and a hold-down line are provided to stabilize the guide. Further details may be obtained from the Patterson-Ballagh Corp., 1900 East 65th St., Los Angeles, Calif.



MacClatchie Announces New Type Wall Cutter

MacClatchie Manufacturing Co., Compton, Calif., has announced development of the MacClatchie 3-Cone Wall Cutter, especially made for enlarging the hole below the shoe to facilitate running pipe,

cementing, and performing other well completion operations.

Similar in cutting action to a roller bit, this tool starts a formation shoulder around the circumference of the hole, rides on top of it and cuts the formation completely away, increasing the diameter of the hole two inches. Completely stabilized and centered, the Cutter smoothes out irregularities in the wall of the hole and removes formation broken by the drilling bit. The two inch increase in diameter obtained is ample to make liner setting, cementing, etc., easier and quicker.

The 3-Cone Cutter consists essentially of three arms equally spaced on the body, with a rock bit cutter on the end of each. Circulation ports behind the cutters and through the tool keep the cutters clean and permit full circulation to be maintained. When starting in the hole, the arms are contracted by means of a special compression collar that automatically comes off when the tool is run into the casing. The tool can be rotated or raised up the hole while running in without harming the casing.

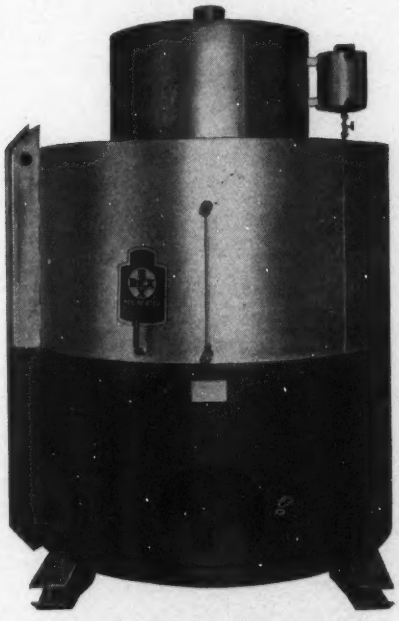
The instant the Cutter passes through the shoe the arms expand. As rotation is begun the cutters quickly start a shoulder around the circumference of the hole. The tool rides on top of this shoulder, cutting it completely away and enlarging the hole two inches over its original size. When the tool is started out of the hole, the arms are again contracted into the recess in the body as they contact the casing shoe.

The MacClatchie 3-Cone Wall Cutter is made in a wide range of popular sizes. Full particulars can be obtained by writing direct to MacClatchie Manufacturing Co., Compton, Calif.

Rex Company Appoints Howard Supply on Coast

The Rex Co. at Houston, Texas, manufacturers of Rex Pre-Heaters for Oil Field Boilers, has announced the appointment of Howard Supply Co. as its exclusive California distributor.

The function of the Rex Pre-Heater is to raise the temperature of boiler feed water to near boiling point before it enters the boiler. Of equal importance is the fact that it positively removes



impurities from the water, keeping the boiler tubes remarkably clean. The numerous advantages of delivering clean water of from 200 to 210 degrees to the boilers are immediately obvious: an abundance of quick steam immediately available, no waiting for steam and consequent loss of rig time. Wear and tear on the boilers caused by cold feed water is reduced to an absolute minimum. By the use of Rex Pre-Heaters it is necessary to raise the temperature of the water only a few degrees, thus creating a tremendous saving in fuel cost.

Clean boiler tubes contribute greatly to the efficiency of the boilers and reduced maintenance cost. The Rex Pre-Heater removes silt and sediment as a sediment trap is provided. Sediment can be disposed of by simply opening a valve and blowing the sediment out.

The Heater liberates oxygen dissolved in the water before it enters the boilers, thus preventing any internal corrosion.

According to the maker, the Rex Pre-Heater operates on exhaust steam from the drilling engine and boiler feed pumps. This steam ordinarily is automatically wasted. Heat from the steam is transferred directly to the boiler feed water, the most efficient method of heat transfer known. There is no vapor locking at high temperatures.

Rex Pre-Heaters are made in two sizes, 40 barrel capacity in which the water usually remains at high temperature for an hour, and the 90-barrel size, where the water remains hot for 2½ hours before entering the boilers. Purchases have shown the large size to do the best job, even though the small size will heat all the water a three-boiler rig can use the makers say.

A thermometer is standard equipment on all Rex Pre-Heaters to enable the operator to determine the temperature of his boiler feed water at a glance.

The Pre-Heater can also be furnished with chemical feeder for conditions where it is warranted.

Rex Pre-Heaters have a wide acceptance by drilling contractors and operators throughout the Mid-Continent and Gulf Coast; also in foreign fields. It is understood that several Rex Pre-Heaters are already in use in the California fields.

John A. Roebling's Sons Appoints General Manager

Charles G. Williams, formerly vice president in charge of purchasing and manufacturing operations for the fifteen plants of the American Chain and Cable Co., Inc., has been appointed general manager of the John A. Roebling's Sons Co., Trenton, N. J.

Mr. Williams was born in Hartford, Conn. on August 25, 1885. He attended the Phillips Andover School in Andover, Mass. and later received his degree in Mechanical Engineering from the Sheffield Scientific School, Yale University, Class of 1908.

After leaving college, he was employed for a time by the Terry Steam Turbine Co. of Hartford, Conn., as a member of their engineering department.

In January 1913, he was made purchasing agent of the American Chain and Cable Co. plant at Oneida, N. Y. Shortly after the acquisition of the Standard Chain Co. in 1916, he was appointed general purchasing agent of all plants of the company and was, in 1928, made general production manager. In 1930, he was made a director of the company and, in 1936, was appointed vice president in charge of all manufacturing operations in the fifteen plants of the company.

Mr. Williams will assume his duties with the John A. Roebling's Sons Co. on March 1, 1940.

You are reading the Pacific Coast oil men's home paper.

Newly developed transparent lacquer gives all-weather protection to polished brass.

Regan Forge Appoints Bob Hill Mid-Co. Head

R. A. Hill

R. A. (Bob) Hill, has been appointed manager of the Mid-Continent Division of Regan Forge & Engineering Co. Mr. Hill is a native of Texas, having lived in Houston since his early childhood. He attended Rice Institute, and has been associated with the oil industry for the past 20 years having been employed in the drilling, production, pipe line, refining and marketing divisions of various oil companies.

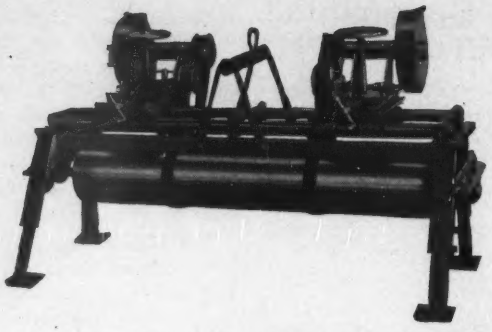
In 1928 he was made Mid-Continent sales representative for A. M. Byers Co. of Pittsburgh, Pa. In 1931 he was made division manager of Broderick & Bascom Wire Rope Co. of St. Louis, Mo., with headquarters at Houston, in which capacity he remained until his recent appointment with Regan Forge & Engineering Co.

Few men of his years have had such signal success in their various fields of endeavor. A host of influential friends in the oil fraternity wish him continued success in his new work.

Mr. Hill's headquarters will be in Houston at the offices of the Regan Forge & Engineering Co. for the Mid-Continent Division, 1502 Maury St.

Rotary Drum Flanges Serviced on the Job

Eliminating the necessity of removing rotary drum flanges from the drawworks or the drum, a portable flange grinder has been developed by Patterson-Ballagh engineers. It is a simple, rugged unit that will hold a close adjustment under heavy oil field duty, and is so simple that it can be operated by the regular drilling crew. By its use flanges can be ground when the first grooving takes place. Thus a large saving is effected in brake lining. The machine is a portable double grinding unit with two carriages operated similar to a lathe. Independently operated carriages travel lengthwise on large common cross shafts or slide rails. Each carriage mounts a 14-in. grinding wheel individually housed, equipped with safety glass windows and lighting fixtures. The countershaft, located in the center of the unit running parallel to the drum shaft, drives both grinding wheels at the same speed. Each grinding wheel can be moved to the right or left, advanced or returned, independent of the other wheel. Grinding is absolutely parallel to the drum shaft at all times. Alignment is accurately maintained. The unit is driven by any portable gas engine of 10 h.p. or more,



or by an electrical motor. The shipping weight of the complete machine is 1400 lbs. To line up and start the grinding is a matter of only a few minutes. A coarse wheel makes the rough cuts and takes most of the wear. A finishing cut with a finer wheel surfaces the flange like a mirror. The countershaft is equipped with sealed ball-bearings, with pillow blocks set in rubber to reduce vibration. Further details may be obtained from Patterson-Ballagh Corp., 1900 East 65th Street, Los Angeles, Calif.

Improved Combination Hook Announced by Regan Forge

An improved combination hook is announced by Regan Forge & Engineering Co. It is available for 300-ton capacity and can be ordered for 100 and 200-ton

capacities. This hook embodies two separate load carrying elements. The large lower hook carries the swivel bail and the two smaller hook elements formed by the cross yoke carry the elevator links. The cross yoke is slidably mounted within an aperature of the main hook. This hook can be locked in any of four positions. It has a safety lock. When the latch on the large lower hook is in open position it hangs at a convenient angle and readily engages the swivel bail, the weight of which automatically closes and locks the latch in the closed position. This hook is cast of alloy steel, heat-treated to produce maximum physical properties, and is tested to one and one-half times the rated safe load. The overall height of the 300-ton hook is 120". Full details may be obtained by addressing Regan Forge & Engineering Co., P. O. Box 150, San Pedro, Calif.

"Al" Forrow Touring In Southern Republics

E. W. "Al" Forrow, general sales manager, Security Engineering Co., Inc., Whittier, Calif., manufacturers and distributors of Securaloy, Security Drill-

"Al" Forrow

able Products and Sievers Reamers, left Jan. 26, on a two months' tour of Venezuela, Colombia, and Trinidad.

Mr. Forrow is accompanied by Mrs. Forrow and will be joined in Trinidad by W. C. Langley, Security Engineering Co., Inc. representative for that area.

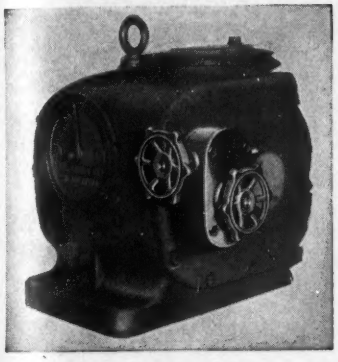
There is one truck for every seven families in the United States. Taxes on these trucks add $15 to the annual cost of living of the average American family.

Link-Belt Vernier-Control Variable Speed Transmission

Announcement is made by Link-Belt Co., Philadelphia, that it is now in position to equip all sizes of the Link-Belt P.I.V. Gear variable speed transmission with vernier control, for installations where extremely fine control of speed changes is required.

This vernier control can be supplied with either one of two ratios—7½ to 1 or 30 to 1, and is equipped with two hand wheels. One is for direct control; the secondary, or vernier type control hand wheel will provide either 30 turns or 7½ turns to one of the direct wheel, depending upon which ratio of worm-gear reduction set is furnished.

As vernier control is said to provide the fine sensitivity required for true micrometer adjustments of speed, the manufacturers are particularly recommending it for such services as—synchronizing the speeds of two machines;

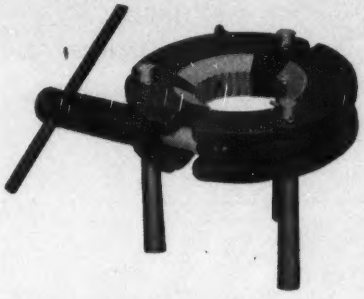


justifying for shrinkage and expansion of such products as textiles and paper; controlling feeders; on weighing operations; obtaining exact register; controlling the overlay of wire-covering; on wire producing machinery; or wherever the uniformity of a product can be assured by such close speed regulation.

Link-Belt Co. 40-page Book No. 1574 covering vernier and other types of P.I.V. Gear control, will be sent to any reader upon request addressed to the company at 2045 W. Hunting Park Ave., Philadelphia.

Drill Collar Clamp For Flush Pipe Security

With the widespread use of streamlined drill collars and other types of external flush pipe, drilling crews are fearful of the time when the rotary slips fail. These dangers are eliminated by the use of a new tool introduced by the Poist Tool Co., 2750 Cherry Avenue, Long Beach, Calif. It is a drill collar clamp called Griplok. It provides an unyielding grip on the pipe collar or liner. It is applied to the pipe before breaking out the joint. Griplok is an adjustable clamp consisting of four steel segments held together by three tapered pins, and locked with a tie-bolt. It is self-adjusting and is equipped with interchangeable slips which fit all sizes of pipe. It can be locked on in 30 seconds. A convenient tie-bolt cinches the inserted slips, with stress evenly distributed throughout the pipe's periphery. The three long tapered pins serve a useful purpose. If the pipe falls, due to dull or worn slips, or from any other cause, the pins, striking the table slips, tighten the device. At the same time they help to absorb the shock of the drop and



also tighten the cinch of Griplok around the pipe. This device is placed a few inches above the rotary table slips. Further information may be obtained from the manufacturer.

Bart Gillespie Joins Security Engineering

Bart W. Gillespie's legion of friends and acquaintances will be interested to learn that he has joined the organization of Security Engineering Co., Whittier, Calif., as export manager.

Mr. Gillespie has been actively identified with various phases of the petroleum industry since 1917 and his unusually broad and well diversified experience

in both field operations and oil tool manufacturing and marketing qualifies him exceptionally well for his present post.

Some years back, Mr. Gillespie was engaged in the manufacture and marketing of drilling and coring equipment. Recently, however, he has been active in the petroleum operations of the Latin American countries. He returned a short while back from a year with the Y.P.F.—the Argentine Government's Petroleum Producing Unit. He spent the two years prior with the Ganzo Azul of Peru and earlier was associated with the A.G.W.I. of Mexico.

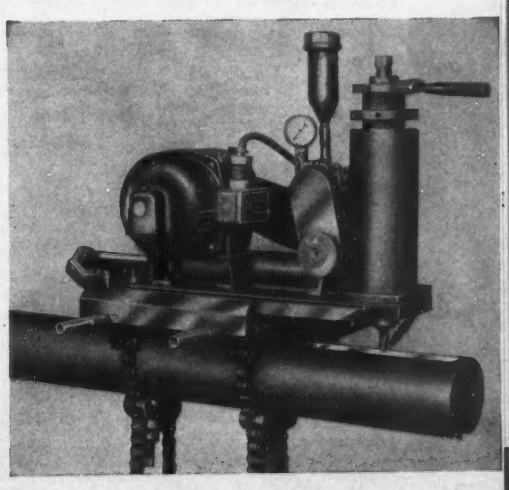
Portable Keyway Cutter, Milling Machine Saves

To eliminate the necessity of disassembling heavy machinery such as drawworks, engines, etc., in order to cut a new keyway, the Shull Portable Keyway Cutter and Milling Machine has been designed. The necessary repair work can now be done on the job without dismantling equipment. Heretofore, great expense has been incurred and disruptions to operations caused by shutting down for hours, if not for days, to send a shaft to a machine shop for milling a new keyway or enlarging an old one that has been damaged or worn.

This newest of Shull tools can be transported from lease to lease and any shaft can be rekeyed without removal from the machine or engine. It has a hydraulically-operated feed, with precise control so that extreme precision can be obtained to very close tolerance. Not only will it cut keyways, but with its universal feed it can be used as a milling machine and for cutting slots in pipe, for routing and for drilling holes.

The tool is self-contained, compactly designed and easy to lock in position. It is equipped with a pressure cylinder, pressure pump with automatic cut-off and a 1-horse-power motor for connection with cord and plug to any light socket. The traveling base on which the various units are rigidly mounted is made of fine semi-steel, accurately milled, with traveling ways precision-machined. The entire assembly can be conveniently lifted by two men and placed on a shaft to which it is locked tightly with a double chain binder. Any size of drill up to 1" or cutter can be inserted in the chuck. Two operating levers are used for hydraulically controlling the longitudinal and cross feeds. The vertical feed is by hand. After rigging up, it requires only 30 minutes to reslot a 12" keyway. With a maximum feed length of 14", cross feed of 12" and a vertical feed of 4", this tool can perform practically any milling operation desired on a lease.

Details may be obtained from Shull Perforating Co., 2752 Cherry Ave., Long Beach, Calif.



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MAPS

Large maps of Los Angeles Basin oil fields and map showing all California oil fields. Price $15.00 each on paper and $20 each on cloth. Individual state oil and gas maps of Mid-Continent and Rocky Mountain regions. Maps show geological cross sections at base. These maps indicate wells drilling, wells producing and abandoned, with depths.
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Seal Beach Well Flows 500 Bbls.

Flowing at the rate of 500 bbls. of clean oil a day, Tide Water Associated Oil Co. brought in Bryant No. 7 in the easterly section of Seal Beach. The hole is open from 4320 to 4343 ft.

Barnsdall Deepens Rancho San Francisco

Rancho San Francisco No. 1, discovery well of the Newhall-Potrero field, was deepened to the third zone and recompleted flowing 1100 bbls. of 35 gravity oil from 7012 ft. No. 2 is being deepened from 6712 ft. and No. 9, a new well is drilling at 1000 ft.

EMPLOYMENT WANTED

Graduate geologist with degrees in mining and petroleum engineering. Sixteen years practical experience. Good surveyor and draftsman. Speaks four languages and will go anywhere. Box 14, care Calif. Oil World. 1/20bd

Oil Men's Calendar

C.N.G.A. Meeting First Thurs. Each Month.

February

12-15—American Institute of Mining & Metallurgical Engineers, New York.

April

8-12—American Chemical Society, Cincinnati, Ohio.
10-12—American Association of Petroleum Geologists, Chicago, Ill.
11-12—American Petroleum Institute, Eastern District, Division of Production, Columbus, Ohio.
18-19—National Petroleum Assn., 37th Semi-Annual Meeting, Cleveland Hotel, Cleveland, Ohio.

May

1-3—Petroleum Industry Electrical Assn., Dallas, Texas.
15-17—Natural Gasoline Association of America, Hotel Tulsa, Tulsa, Okla.
18-25—Int. Pet. Exposition, Tulsa.

Maximum airplane power is produced when the fuel is injected directly into the cylinders, aeronautical experiments show.

Cheering news is an attachment for pneumatic-tired lawn mowers which converts them into gasoline-powered snow plows.

California Crude Oil Production

Two Weeks Ended January 27, 1940

	January Daily Quota	Average Daily Production	Excess
San Joaquin Valley			
Belridge—North	12,227	11,285	*942
Belridge—South	2,064	1,930	*134
Buena Vista	16,614	17,537	923
Canal	5,877	5,715	*163
Coalinga-E. (Eocene)	11,505	9,793	*1,712
Coalinga—East-West	15,532	9,240	*6,292
Cole's Levee	3,345	3,245	*100
Edison	2,328	2,047	*281
Elk Hills	7,509	11,163	3,654
Fruitvale	6,080	5,754	*326
Greeley	3,608	3,430	*178
Kern Front	7,342	6,474	*868
Kern River	6,762	4,040	*2,722
Kettleman No. Dome	33,771	48,028	14,257
Lost Hills	3,979	4,161	182
McKittrick	3,673	3,515	*158
Midway	37,118	40,895	3,777
Mount Poso	10,091	9,557	*534
Mountain View	9,198	9,902	704
Rio Bravo	7,410	7,594	184
Round Mt. and Coffee Canyon	7,561	7,914	353
Ten Section	8,490	8,622	132
Wasco	1,175	1,131	*44
Other Fields	3,361	3,238	*123
TOTAL	226,620	236,210	9,590
Coastal Counties			
Elwood	3,680	3,973	293
Rincon	2,508	4,103	1,595
Santa Maria	6,240	3,215	*3,025
Gato Ridge	2,441	445	*1,996
Santa Maria Valley	18,602	9,614	*8,988
Santa Paula-Newhall	5,708	5,970	262
Ventura Avenue	31,263	37,223	5,960
Other Fields	5,169	5,287	118
TOTAL	75,611	69,830	*5,781
Los Angeles Basin			
Alamitos-Seal Beach	7,140	7,259	119
Brea-Olinda	8,040	5,814	*2,226
Coyote—East	3,253	2,859	*394
Coyote—West	10,013	6,799	*3,214
Domingues	16,768	19,620	2,852
El Segundo	2,742	2,783	41
Huntington Beach—New and Old	23,159	27,940	4,781
Ingelwood	12,954	12,825	*129
Long Beach	40,489	45,894	5,405
Montebello	5,884	6,350	466
Montebello-West End	24,912	20,278	*4,634
Playa del Rey	4,081	4,416	335
Richfield	7,271	8,304	1,033
Rosecrans-Athens	8,078	9,817	1,739
Santa Fe Springs	24,294	26,065	1,771
Torrance	5,414	5,212	*202
Torrance "24" and "D & B"	7,033	7,982	947
Wilmington	79,927	84,885	4,958
Other Fields	3,701	4,120	419
TOTAL	295,153	309,223	14,069
STATE TOTAL	597,384	615,262	17,878

*—Shortage.